









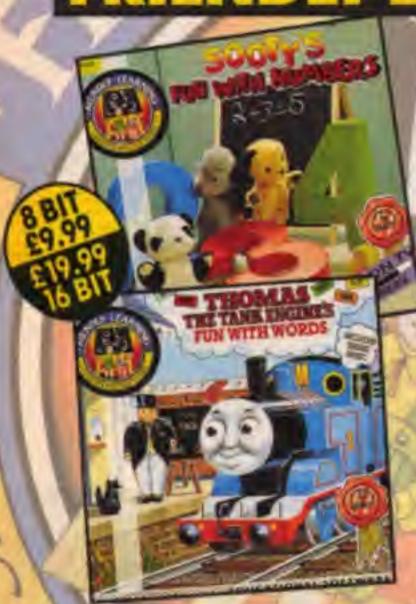






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# REGULARS

GOTO 13 Rom and Ram The Games Gang **GOTO 18** GOTO 21 **Build a Database** How to Make Money **GOTO 25** How a Computer Works **GOTO 27** Safe Scientist **GOTO 35 Program Doctor GOTO 39** Logo Lowdown **GOTO 43** 

I think that the idea of a database listing is brilliant. I also liked the secret message maker in the November issue.

I have an Atari STE. But your programs and competitions never list it. Could you please say which will work on the STE?

Owen Williams (12),
 Halstead, Essex.

In general, any program for an ST should work on an STE. All the programs listed for the ST in Let's Compute! work on either.

Remember, the programs are all designed to work in STOS. You must Run that before typing in the Let's Compute! programs.

I would really like to own one of the Let's Compute! caps. But in case I don't get a letter printed in your mag why don't you let people buy the caps?

- Ryan Simpson, Craigavon, County Armagh.

You don't need to buy one because we've printed your letter. One goes free to the writer of EVERY letter we print.

If anyone else wants one they can get them for £3.

Send a cheque or postal order to: Let's Compute! Europa House, Adlington Park, Macclesfield SK10 4NP.

# 10 ties

If you have any tips for other readers, send them in. And if you have any questions about your computer or software just ask us. We'll try to answer them on the Noticeboard.

Let us know what you want to see in future issues. And if we use your letter or ideas we'll send you a Let's Compute! baseball hat!

Send your letters to:



Let's Compute! Europa House, Adlington Park, Macclesfield SK10 4NP.

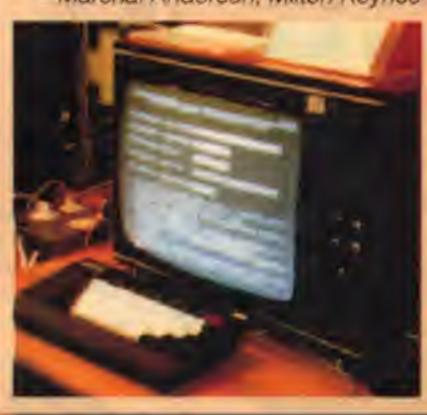
Remember to tell us your age.

On a recent visit to the USSR I had a stroll through the Exhibition of Economic Achievements. I noticed a rather interesting exhibit – a Russian-made home computer. The photograph shows what it looks like. It's only used to cast horoscopes and doesn't seem to have any backing store such as a disc drive.

I assume all the software needed for the forecasts is held in the computer's memory. If anyone knows any more about these contraptions I'd love to hear.

They look like the sort of thing Sir Clive Sinclair may have designed. I wonder if he had anything to do with it?

- Marshal Anderson, Millon Keynes











The badge we gave free on the cover of the issue is just one of the set of four shown above. There's still time to get your set.

Just send two £1 coins to Let's Compute! Badge Offer, PO Box 2, Ellesmere Port, South Wirrral L65 3EB.

# AND HERE'S A SPECIAL OFFER FOR LET'S COMPUTE CLUB MEMBERS!

Club members can get the badges for half price. Just quote your membership number and send one £1 coin when you order.

Remember to tell us your name and address!

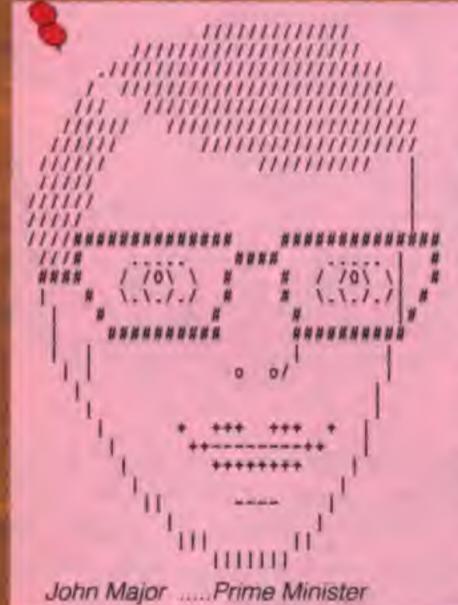
I've written a short program for my Spectrum and think it would be ideal for Let's Compute! But I don't know if it will work on other computers.

Is it worth me sending it to you?

- Alan Short (14), Glasgow

We love to see readers' programs and hear their ideas. If we like them, we can convert them to all computers. If it's only an idea we can write the program from scratch.

When you send us programs or ideas remember to include your name and address. It's also handy if you can let us know a phone number where we can contact you.



Wow! That was quick. John Major became Prime Minister on November 28 and this picture from Michael Wood (14), Storbridge, West Midlands arrived at the Let's Compute! office on November 30.

That was just in time for it to be entered in our Alphabet Artist contest. The judges are now hard work deciding who will get all the prizes of gift vouchers and Art Studio programs from Impact Software.

The winners will be announced in the next issue of Let's Compute!

I think Let's Compute! is brill! I have really got to grips with Logo. I think all your competitions are each very different but all very good. Will there be any competitions or special offers for club members?

- James Allwood (11), Clevedon, Avon

Last month club members could buy badges for half price.
This month, in the contest on page 9, there's an extra prize that's only for club members.

That's just a start. We've lots more offers and competitions planned for the future.



# HIGH SCORES!

Your high scores are still flooding in. There are more than ever on Page 39.

If you haven't sent your scores yet - or want to send us more - there's another coupon on the page. If you don't want to cut up your Let's Compute! just copy it onto a piece of paper.

I typed in the Witches' Brew program from the October issue. I made all the changes given for a CPC so it would work on my CPC 6128.

When I had finished it came up with Syntax error in 410. That I;ine is:

# 410 LET R=FNr(21)

I typed it in exactly as it is printed in Let's Compute! Was something wrong with it?

- Ryan Baldwin (10), Luton, Beds.

We often get letters saying that the computer reports an error in a line that has been typed in exactly as printed. Well, sometimes the computer reports the wrong line number.

One of the most common is, for example, Out of Data in Line 10. Suppose Line 10 is:

# 10 READ A,B

There is no DATA line so you'll get the error although there's nothing wrong with Line 10 itself. Type it in and RUN it to check. Now enter Line 20:

# 28 DATA 1234

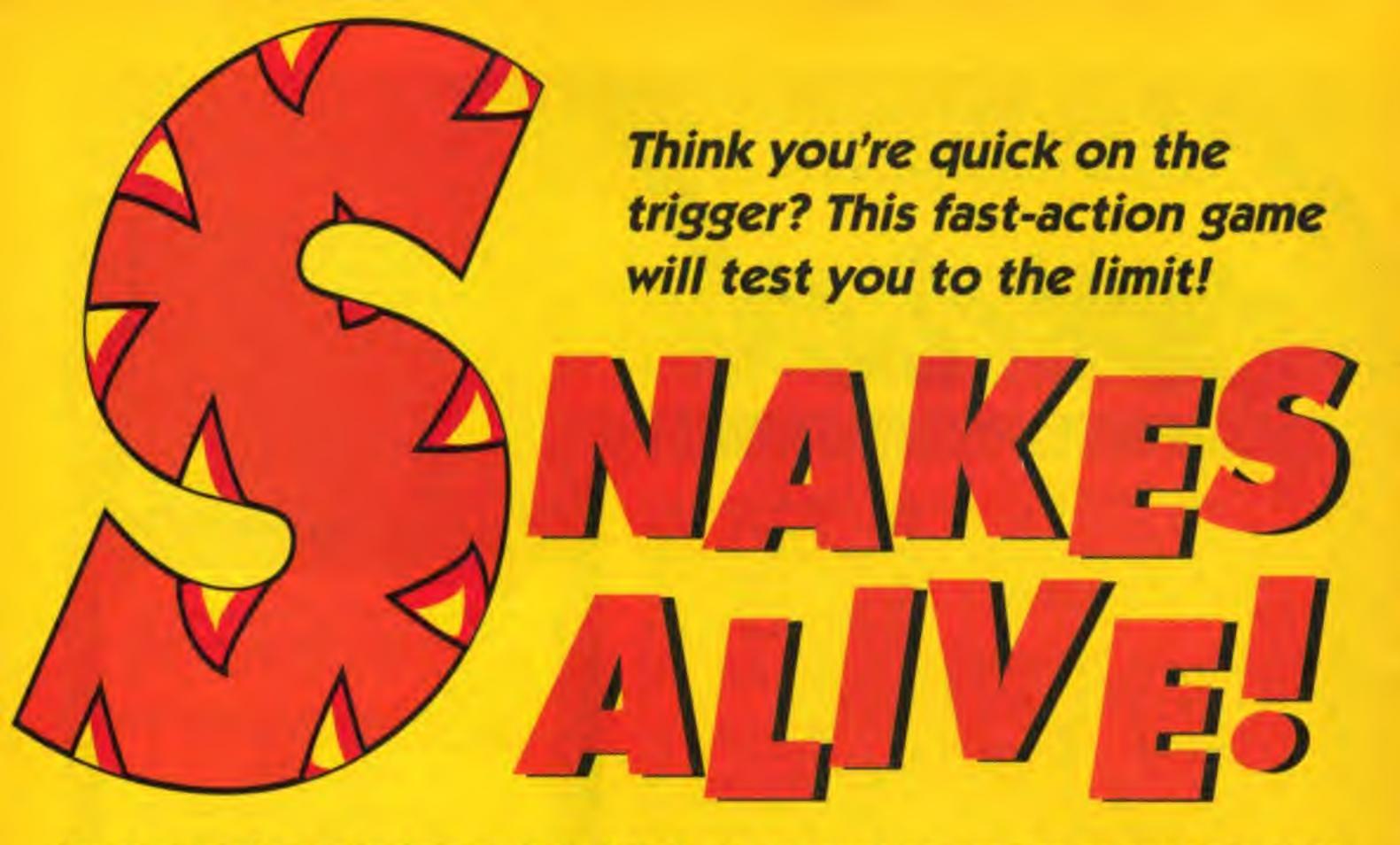
When you RUN it you'll still get an error message saying Line 10 is wrong. But the mistake is in Line 20. Change it to:

# 20 DATA 12,34

The error will have gone. Your computer now has two numbers to read in to memory locations A and B. So even a missing comma in Line 20 causes an error to be reported in Line 10.

Your problem with FNr is similar. The program works as printed.

You must have made a mistake as you typed it in. Check Line 30. Although the error message says Line 410, a mistake in that Line 30 would cause the same message.



Here's an action packed game that's full of fun. Type it in and play it just as it is.

But, to add to the fun, we list below loads of suggestions for changes. Some are simple and can be done by anyone. Others will prove a challenge even to more expert programmers.

Once you've typed it in and played it a few times, see how you can improve it. Experimenting and changing a working program is a great way to learn about computing.

In the game a long snake comes out of a hole in your computer screen. But how much of it can come to the surface before it collides with something?

Move it round the screen with care. Don't

let it touch the border or any part of its body that's already come out of the hole. To make it even more difficult, scattered around the screen are obstacles. These must be avoided at all costs.

The idea is to keep going for as long as you can. You'll need to be quick to miss all the things on the screen. And you have to use all your skill to work out the best way to move around.

Your score, and the highest previous one, are shown at the top of your screen. Can you do better?

Type it in, SAVE it and RUN it. Let us know your high score. We'll put the best on the High Score Challenge table.

## ADAPTING YOUR GAME There are lots of ways you can change this Use different playing keys. Alter the number of obstacles Line 40 lets you have about 40 obstacles. You can program to make your own game, Here are just Lines 190 to 220 sets the keys you use to play the game. Change these as you wish. Note that we say about 40 because an obstacle may You could your studies make once on that you a (ew ideas). pe drawn on loo of one that is already diere. Each Change the shapes. The letters used to draw the snake, the border can use a joyetical or the joyoccard described on and the obstacles are set in Lines 50, 60 and 70. nine trus importus and less will be displayed Pages 10 and 11 After toose to any letters you want. It your Set the speed Lines 580 to the end of the program are the crash computer was keys that produce graphic Line 80 contains a number that sets the speed routine. Put anything you want there: liashing of the game. Make it larger if the game is loo characters you can use these instead. On you know how to detine characters and hast for you. Reduce it for a bigger challenge. screens, explosions and so on. Remember to put the word RETURN on the last one use colour on your computer? Then you can use Modify the display bricks for the border, bombs for the obstacles Line 30 contains numbers that define the size of and a stimy-looking green shape for the snake. High Scores the playing areas. Reduce the numbers and Give the name a high-score table. you'll get a smaller area. A different game each time Make the obstacles form a maze so you can guide. Use your computer's random teature so that This realises it more without to per a fright more? some or all of the above are changed each time. the snake to treedom. Put same sound instructions in the program. you play.

# THE KEYS TO USE:

Down ... M

Left ... Z

Right ... X

Pause ... Any other key

NOTE USE CAPITAL LETTERS

# IS THIS YOUR COMPUTER?

# ATARI (Stos)/Amiga (Amos)

Change the following lines:

30 LET W=40:LET D=20:REM SCREEN SIZE
80 LET T=200:REM SET SPEED
110 MODE 0:KEY OFF:HIDE ON:CURS OFF
310 LET KS=INKEYS
360 PRINT LOCATE X+1,Y-1:AS;
390 LET X=RND(W-2)+1:LET Y=RND(D-8)+6

# Commodore 64/128

Change the following lines:

30 LET W=38:LET D=25:REM SCREEN S12E 110 PRINT CHR\$(147); 310 GET K\$ 360 POKE 211, X-1:POKE 214, Y-1:SYS 58732:PRINT A\$; 390 LET X=INT(RND(0)\*(W-2))+2:LET Y=INT(RND(0)\*(D-8))+7

# Spectrum

Change the following lines:

38 LET W=32:LET D=22:REM SCREEN SIZE
118 CLS
318 LET K\$=INKEY\$
368 PRINT AT Y-1, X-1; A\$;
398 LET X=INT (RND\*(W-2)+2):LET Y=INT
(RND\*(D-8)+7)

# PC (GW Basic)

Change the following lines:

30 LET W=40:LET 0=24:REM SCREEN SIZE
110 SCREEN 1:CLS
310 LET K\$=INKEYS
360 LOCATE Y,X:PRINT A\$;
390 LET X=INT(RNO\*(W-2))+2:LET
Y=INT(RND\*(D-8))+7

# **Amstrad CPC**

Change the following lines:

110 MODE 1 310 LET KS=INKEYS 360 LOCATE X,Y:PRINT AS; 390 LET X=INT(RND\*(W-Z)+Z):LET Y=INT(RND\*(D-8)+7)







5s



Count up to nine to help teddy get the honey



Pair the large letters at the alphabet fair





the clock come alive!



Guide the frog from log to log to solve the sums





Correct spelling, grammar and punctuation mistakes



Follow the directions to find the buried treasure

- Atari ST Amiga PC Amstrad PCW €24.99
  - Spectrum C64 Amstrad CPC £12.99 (tape) £16.99 (disc)

In the autumn: BBC, Electron and Archimedes

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Amiga		9921		9922		9923	
PC 5.25*		5891		5892		5893	
PC 3.5*		5894		5895		5896	
Amstrad PCW		5211		5212		5213	
Spectrum	9084	9085	9086	9087	9088	9089	
Commodore 64	9076	9077	9078	9079	9080	9081	
Amstrad CPC	6189	6190	6191	6192	6193	6194	

the code number(s) circled ☐ Cheque payable to Database Software

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Expiry date

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Send to: Database Direct, FREEPOST, Ellesmere Port, South Wirral L65 3EB. Order hotline: 051-357 2961

Postcode \_\_

# Over £600 of printers to WIN for Syour school!

How would you like to win a brand new printer for your classroom? That's the chance being offered all our readers by Mannesman Tally.

The hard-working MT81 is ideal for classroom use. Worth £159, it's an 80-column, 9-pin dot matrix printer.

It has a special paper parking facility, which lets you to switch easily from one type of paper to another.

There are two of these superb printers to be won. All you have to do is answer the four questions below. Fill in the entry form and get your teacher to sign it. Then send it to Let's Compute! to arrive no later than January 31, 1991.

If you win you'll be the most popular person in your school!

1 Which of the following isn't a computer language?

Logo, Basic, Pascal, Mouse

2 One of these computers doesn't use tapes. Which one?

C64, Spectrum, Amiga, Amstrad CPC

3 Which of the following isn't a computer company?

Orange, Apple, Acorn, Apricot

4 Which term isn't related to printers: dot matrix, ferris wheel, inkjet, daisy wheel

# PLUS: For Let's Compute! Club members

Panasonic are offering members of the Let's Compute! Club a fantastic 24-pin printer for their classroom.

The Panasonic KX-P1123 is easy to use and the very latest model. It comes with a vast choice of type styles and fonts. These allow you to use many different

Like all 24-pin printers, it gives you a finer quality of print as you have smaller but more pins. It is also faster than a standard 9-pin printer.

It has loads of other special features and at £295 is extremly good value for money. Just make sure that your membership number is on the Entry Form. If you have all the correct answers, your entry will immediately go into this draw as well as the Mannesman Tally one.



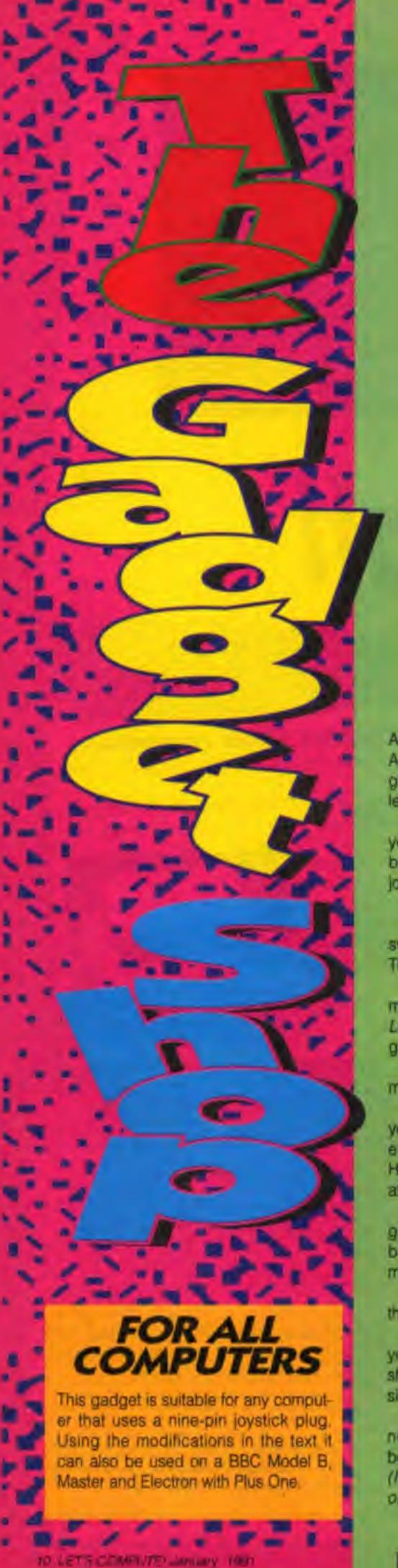
# PRINTER CONTEST ENTRY FORM

 Your Name..... Answers: Teacher Class ......Age..... School 3...... School address 4 Now send this to: Printer Contest, Let's Computel, Europa House, Adlington School Phone No. Park, Macclesfield SK10 4NP. Post Code......Signed ......(Teacher)

ANYONE can take part in this contest and win one of the Mannesman Tally printers.

But the Panasonic prize can only go

to a member of the Let's Compute! Club. If you've joined the club, write your membership number here:



# Gadget shop owner Mike Cook shows you how to put your foot In it – by making a hands-free joystick.

Are you tired of using the same old joystick? Are you getting too good at zapping the bad guys? Have your old games lost their challenge?

If your answer to any of these questions is yes, this month's gadget is just what you've been waiting for. It's a completely new kind of joystick. You use it with your feet!

How do we make one? It's quite simple.

A joystick is really nothing more than four switches. At any time only one is turned on. The rest are off.

Our joystick will have four switches - but mercury ones. We met these in the October Let's Compute! when we made a Sauce Bottle game.

When the switch is tilted a drop of mercury moves and forms a circuit between two wires.

What can we use as our joyboard? I suggest you use a toy that is is sold under lots of different names, like Moon Bouncer or Space Hopper. It's a round disc with half a rubber ball attached to each side.

The idea is that you stand on the disc and grip the top ball between your ankles and bounce. I always fell over so it didn't use it much.

But now it's got a completely new use. It's the ideal platform for a foot operated joystick!

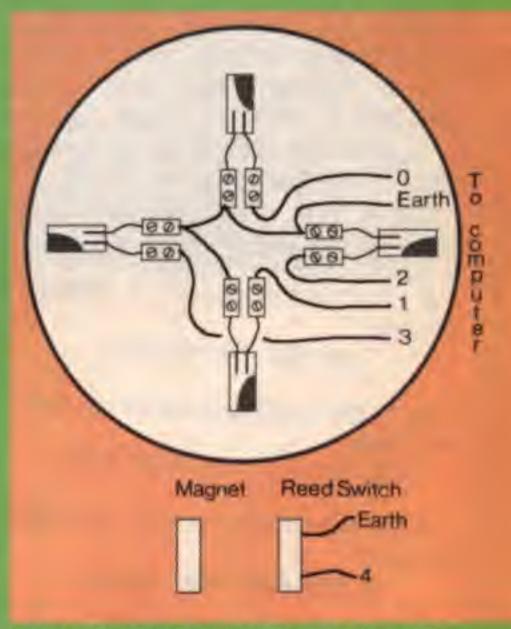
Let's start by connecting the switches. If your computer has a 9-pin joystick socket they should be wired up as in the diagram along-side.

The numbers shown refer to the screw connections on the Gadget Shop connection board. It's the same board we've used before. (If you haven't already made one, you can order one using the form on the right. The pack comes with full instructions.)

Some computers, like the BBC Model B and Master, have a 15 pin joystick connector. For these you need an Analogue Port connector.

This is just like the User Port Gadget Shop connection only it has a 15 way plug on it. It can be ordered using the same form and comes complete with instructions on how to make a connector block. The diagram on the right below shows how to wire the switches to it

Before we go any further let's try it out. Hold all the mercury switches with the wires pointing up



How to thread the wires through the card

IN THE SHOP SOON: . AUTO MONEY BOX



Then load your favourite joystick-controlled game. Turn each switch upside down in turn and watch your screen. Each movement should change direction in the game.

The next job is to mount the four switches on the underside of the Space Hopper. They have to be arranged so that when the platform is level no connection is made.

But position the switches so that slightly tilling the platform will turn-on the appropriate one. The diagram shows how it all goes together.

At first it is best to fix the mercury switches with a small piece of plasticine. Once it is all

Vref Reed Switch

Earth

Fire 0

The pressure pad sandwich

working you can glue them in position to make them permanent and resistant to knocks.

Now all we need is a fire button. We can use a surface mounting reed switch and magnet. Remember, we used them in October's Let's Compute! when we made a burgler alarm. Connect this switch as shown in the diagram.

Attach it to one leg just above your knee and the magnet to the other. When you want to zap just knock your knees together.

You can use an elasticated bandage or something similar to fasten them on.

The mercury switches can be connected using separate wires, but for neater results use six core cable. Similarly the reed switch should be mounted using twin core cable.

As you may have some of this wire at home I have made it a separate item on the order form. This means you don't pay for something you already have.

Now you are ready to put your foot joystick to the test. You get best results if you're seated because you can't really play a computer game while you're hopping around

But happy zapping all the same!

# For BBC Model B, Master and Electron users only

Your computer needs an analogue voltage to be produced by the joyboard. This means that instead of switches being oil or on, a high or is being moved.

So, If the joyboard is level it must give a mid voltage. This is what the wiring diagram here does. It shows how you should wire your loot-

The resistors set as a voltage divider and when there is no movement it produces a mid the resistor and give the right voltage.

# NEXT MONTH

Roll the balls and ring the bells! Build the Gadget Shop's super pinball machine.

# **ORDER FORM**

# Pack 6 - Foot-operated joystick

Mercury Switch and screw connectors £2 each (4 needed)

6 core cable ..... metres at 80p a metre (2 recommended)

Twin core cable ...... metres at 30p a metre (1 recommended)

Analogue Port connector + 4 resistors for Model B and Master (Not Master Compact) £3,99

Surface mounting reed switch and Magnet £2,60 Show what you want by ticking

the correct box below:

□ Floor pressure pad .... £3.55 each.

# You'll also need Pack 1 - the User Port connector cable:

- 20 way IDC plug, length of 20 way ribbon cable, 12 way chock block, cardboard base, 2 foam sticky pads PLUS 2 spare connectors and a resistor .....£1.99
- ☐ As above but with IDC plug ready connected ...£2.49
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Please state your type of computer:

Educational establishment orders accepted.

Make cheques payable to Musbury Consultants and send to: Musbury Consultants, 8 Fairhill, Helmshore, Rossendale, Lancs BB4 4JX

Address ......
Post code.....

# The Commodore A500 Batman Pack must surely rank as one of the most popular computer packs ever! The pack features the Commodore Amiga 500 computer with mouse controller and TV modulator, plus



For the more serious or professional applications user, Commodore have a selection of systems based around the expandable Amiga. 2000, in prices from £1295 a VAT. The A2000 features a full. IMb FIAM (exprandable to 9Mb) 9 system expansion stots plus IBM compairolity with the use of PC-XT or PC-AT bridgeboards. Complete and return the coupen, putting a fice in the A2000 box, for distalls of A2000 compulser systems. + VOK I - ETABOLZE

Commodore A500 Flight Of Fantasy

Flight of Fantasy is the very latest Amige 500 pack from Commodore. featuring BRAND NEW software releases, to make this the most specfacular A500 pack ever! The pack features the Amiga 500 computer with mouse controller and TV modulator, as well as four top software titles. These include the following:

sur the suamound for other Amiga art sinchages. Delune Paint II includes powerful, wanty so user fools that bring aul the artist in you. Create maxim-INCHE, DIFFEURWHORK (\$1) DIFFEL or post flooding

# ESCAPE ROBOT MONSTERS.

Here is pornaming competiting different. a science fishion etary with somic book style graphics. Cur heroes Jake. and Dutte are on the Plyner X ready mg Humana who have telem-captured by the Richat Monaters and lorded to Invested and early Propose Army to DESTROY EASTER Jame and Duse light time way. Priough horder of any Robots to Nato the Humans encape

# RAINBOW ISLANDS

Sip on your maps show practice Prowing a rainbow and you're ready to go talami reports. From the lateral of Don to Monster tolano, you set ancourse Dan himself, slimping insecuwithin combat machines, mechanical secularity the livroduble beings of largend and sulators. Finally array the world of darkness and its sthatillants.

The oblimate in highl amount on with a choice of two arresult and that builts arrandoments with dozens of different factical enceune Asman cumball strategic trimbings, interaclive ground funer faithry endgoing clariers The right of regulation is employed. Privat horse cucked displays resident flue rade enhance the mature two of this sturning Elmulation.

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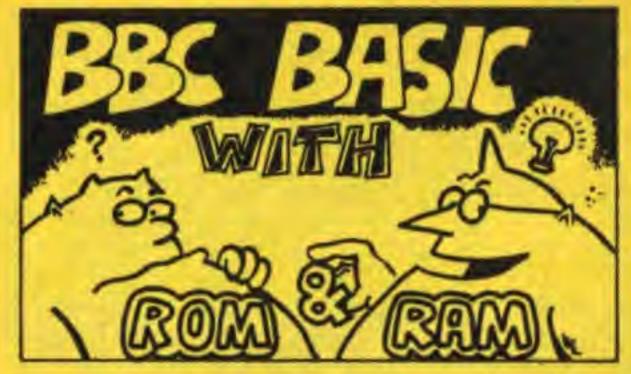
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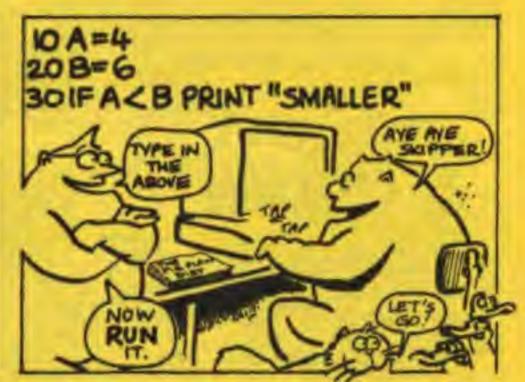
Which computer(s), if any, do you own?







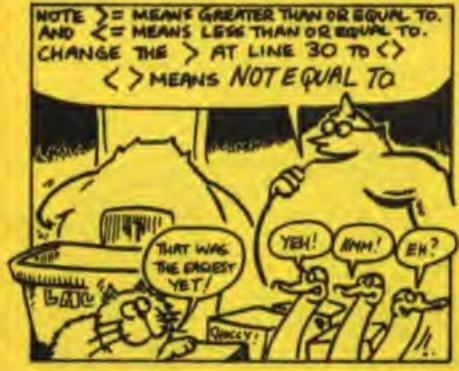




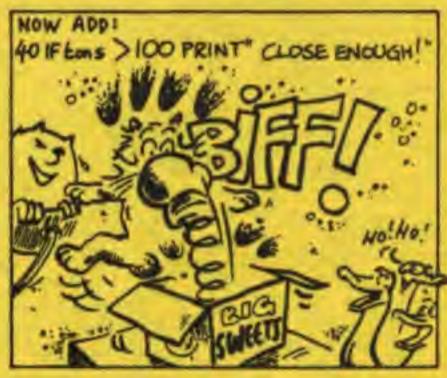




























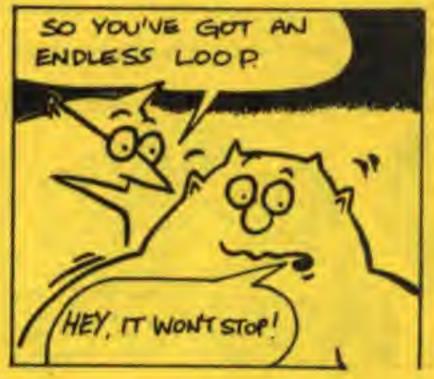








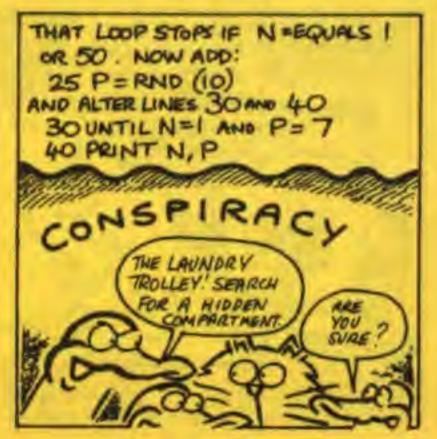


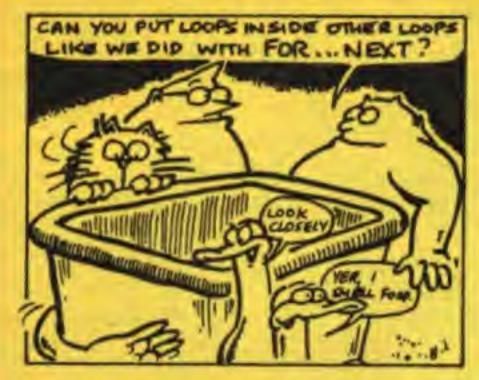










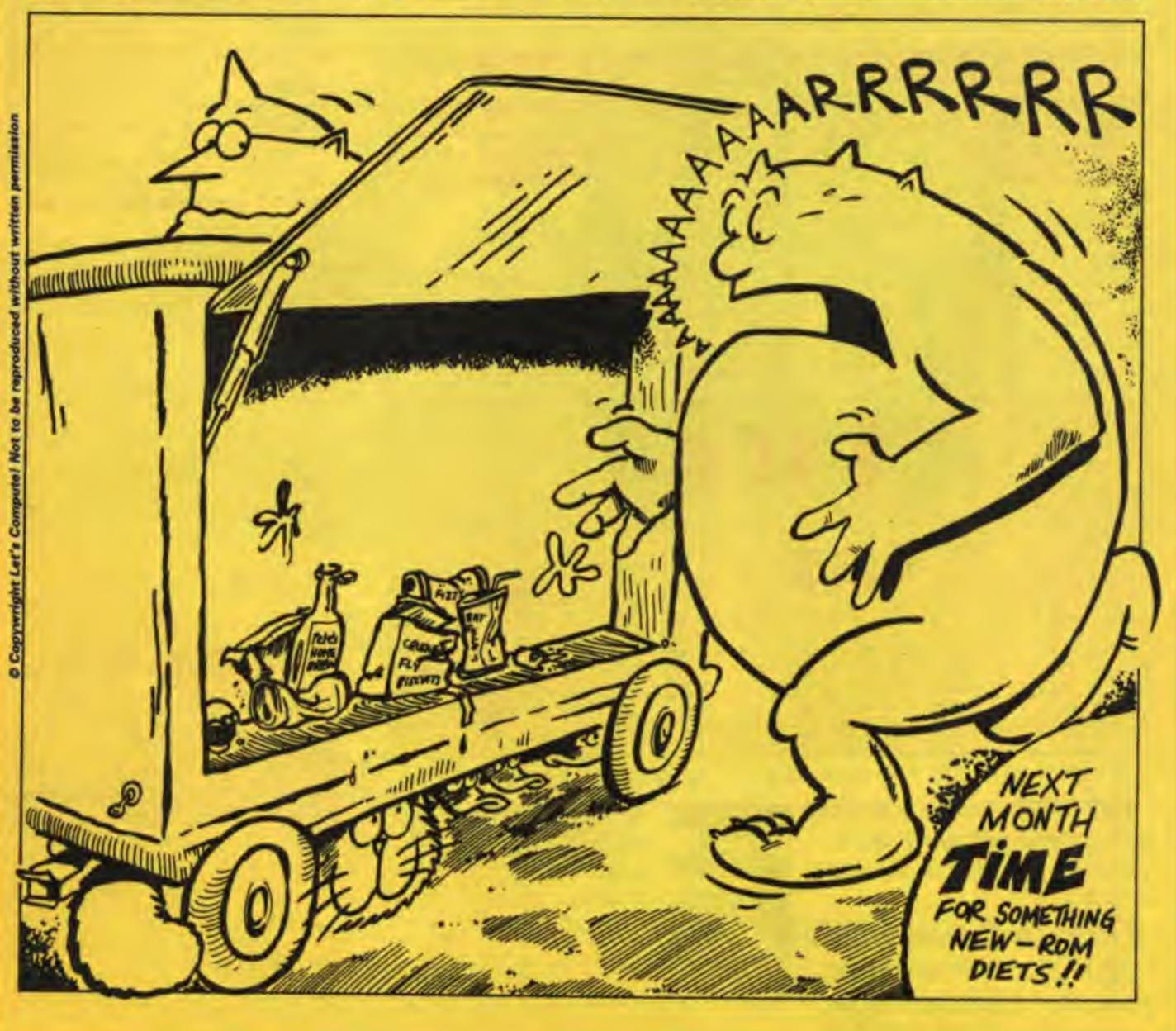












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# The Goodie Bag

There will be TEN prizewinners. And each will get a different prize. Your own special Turtle Goodie Bag could contain a selection of:

- \* Teenage Mutant Hero Turtle Posters
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- ★ Teenage Mutant Hero Turtle T-Shirts
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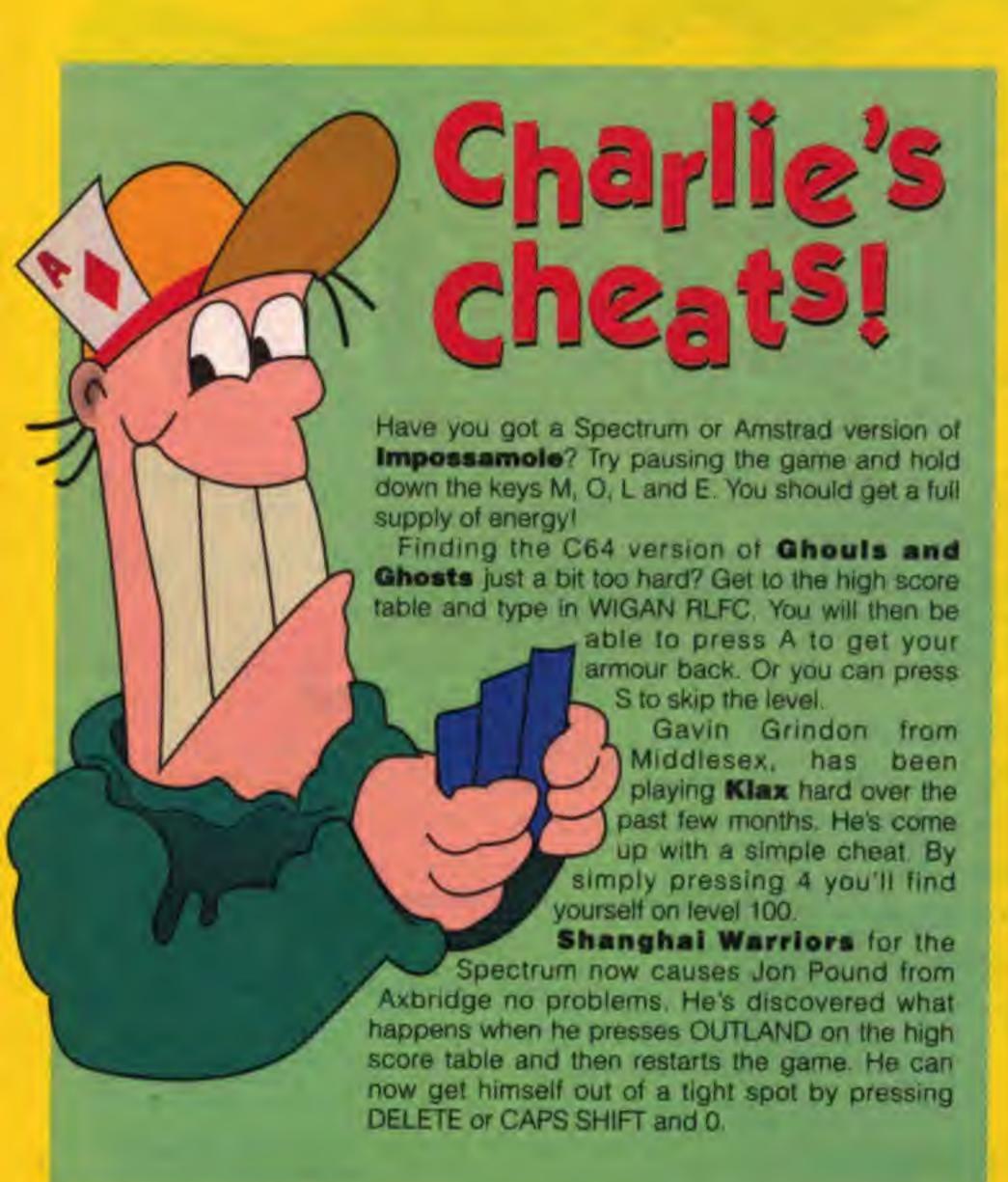
And all you have to do is answer these four simple questions:

- 1. Name all the turtles
- 2. Who is their teacher?
- 3. What are their two human pals called?
- 4. Which gang does the Shredder lead?

Now fill in the entry form and make sure it arrives at Let's Computer! before January 31 1991.

The first 10 correct entries to pulled from the sack will each receive a goodie bag.

ENTRY FORM
Name
Address
AgeAge
Answers
1
2
3
4
Send this entry form to: Turtle Contest, Let's Compute!, Europa House, Adlington Park, Macclesfield SK10 4NP.



# Hard Hat Simulator

Have you ever played Driller, Dark Side, Total Eclipse or Castle Master? All four of these adventure games were put together using Incentive's 3D system - Freescape.

Now you've got the chance to make the most of Freescape for yourself. 3D Construction Kit gives you the best parts of Freescape 2, the advanced version. It allows you to create your own games.

The kit is published by Domark for the PC, Amiga, Atari ST, C64 and Spectrum. It comes complete with a specially written arcade adventure and should be in software shops by April.



# Skatin' USA

Skatin' USA is new from Atlantis. It's a budget tape game that costs only £2.99 for the Amstrad CPC. Commodore 64/128 and Spectrum.

You play Superkid. You may have met him before. But now his special powers are replaced by a skateboard - well armed of course. He takes on the terrors of New York while showing off his skill.

# Sticky Stuff

Stuck with an old-fashioned joystick? Feel like trading in your tired old model for a bigger, better deluxe version? Then why not check out Spectravideo's Mega

Board.

This cream-coloured stick comes complete with two stopwatches. So now you can time your best scores.

It also has variable speed autofire and a slow-motion function. It

costs £24.95.

If you're stuck on Pipemania you'll be thankful for these passwords from Gavin Grindon in Middlesex:

Level	Password
4	Grip
8	Tick
12	Ooze
20	Blob
24	Ball
28	Wild

Though **Drop Ship** is only available for the Archimedes series, a lot of readers have sent in passwords. First in were the ones from Ben Bayliss:

Level	Password
4	Dahlia
7	Gaggle
10	Kaunda





Austin Barnes from Taverham, as well as James Brown from Maidenhead to name but two. have finished BBC's Imogen. Here are the passwords if you are struggling:

Level	Password			
Α	Ballonacy			
В	Dripping-Stuff			
C	See-Saw			
D	Gnu-Problem			
E	Whip-it			
F	Saxaphobia			
G	Down-and-out			
H	Follow-me			
1	Duck-egg-blues			
J	Pavlov-was-here			
K	Tender-hooks			
L	Babboonacy			
M	Applesource			
N	Hamster-jam			
0	Fire-works			
Р	Time-flies			

Boobs from Taunton has four of the five passwords for Superior's Richochet. Can anyone come up with the fifth?

Level	Password
1	Richochet
2	Enigmatic
3	Spiritual
4	Supernova

# Anything you can do, Turrican II

If you're a shoot-'em-up fan you'll probably still have blisters on your trigger finger from playing Turrican. It's Rainbow Arts' incredibly fast, mega-weapon, multidirectional blaster.

Well, start stocking up on the Elastoplast now: Turrican II is on its way.

It's designed by Manfred Trenz and developed - unusually - on the C64. It features Turrican pitted against five worlds packed with more aliens than you can

shake a stick at. All the versions will be great - especially the 16 bit ones. They'll have 1,500 screens, 400k of sound, loads of speech samples and very impressive seven-layer scrolling.

If the fantastic first level demo is anything to go by it should be hot stuff - so start saving now!

Turrican II is due out in February for the Amiga, Atari ST, C64, Amstrad CPC and Spectrum.

# Throwing down the Gauntlet

You've played Gauntlet. You've been stunned by Gauntlet 2. Now prepare yourself for **Gauntlet 3D**. The latest version of the four-player coin-op features the four original characters. And there are four newcomers: Lizardman, Iceman, Neptune and Rockman.

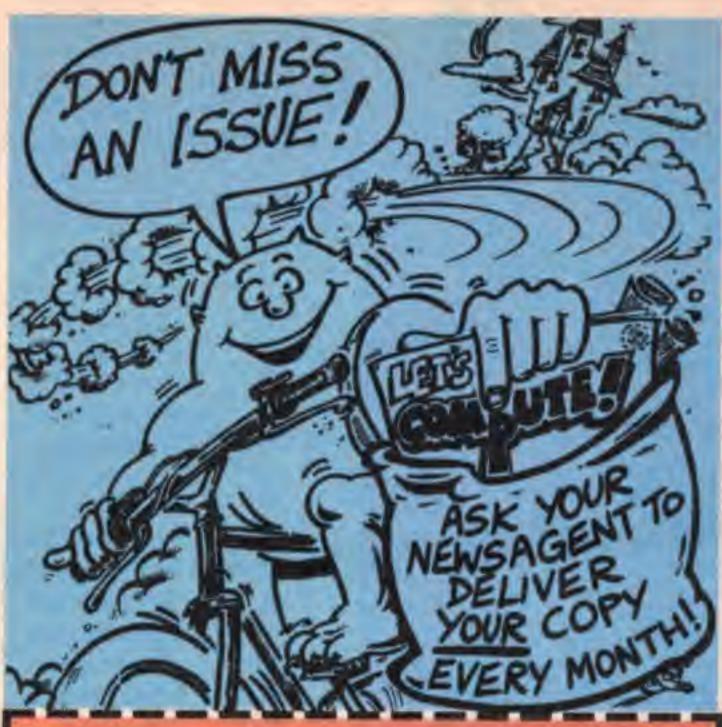
There's also full 8-way scrolling isometric 3D. That looks as good as it sounds! It's pretty hard to achieve - the programmers have done well.

There are loads of new monsters, magic objects, potions and puzzles. And eight totally original levels. But because all this needs a lot of memory, no more than two players can take part.

Gauntlet 3D is expected next spring on all major formats except Archimedes, BBC Micro and Electron.

COLLECTION FROM ADJAN ADJAN

If you've any hints,
pokes or cheats you'd
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Please state the age of your children and make of your computer

1000 REM comm Load cards comm 1818 PRINT "Load a box of cards" 1020 PRINT "-----" 1838 PRINT 1848 INPUT "What is its name";f\$ 1858 IF FE="" THEN RETURN This 1868 12=0PENIN FS program 1070 FOR X=1 TO 255 works on 1080 INPUTUZZ,CS(X) all home 1090 NEXT A micros 1100 tlose #22 1110 RETURN 2000 REM mount Save cords mann 2010 PRINT "Save a box of cards" 2020 PRINT "-----2030 PRINT 2040 INPUT "What is its name"; FS 2050 IF FS="" THEN RETURN 2060 ZZ=OPENOUT FS 2070 FOR K=1 TO 255 2080 PRINTSIZ, CB(X) 2090 NEXT E 2100 CLOSE #27 2118 RETURN

# IS THIS YOUR COMPUTER?

# Electron/BBC/Archimedes

The program will work as shown

# Atari ST(Stos) AMIGA (Amos)

Change the following lines.

THE CLUSE PT THE CLUSE PT ZHEN OPEN OUT AT, PE ZHEN PRINTEL, CP(X)

STAN CLASS OF

# Commodore 64/128

Change the following lines:

1886 SHEN 1,1,6,78 1886 SHEN 1,1,6,78 1188 SLOIS 1 2888 SHEN 1,1,1,70 2888 PRINTES, CROXI 2188 CLUSE 1

# Spectrum

Leave out Linus 1070 to 1100 and Lines 2070 to 2100 Change Ine following lines.

COST LAND OF DAYS CELL

# PC(GW-Basic)

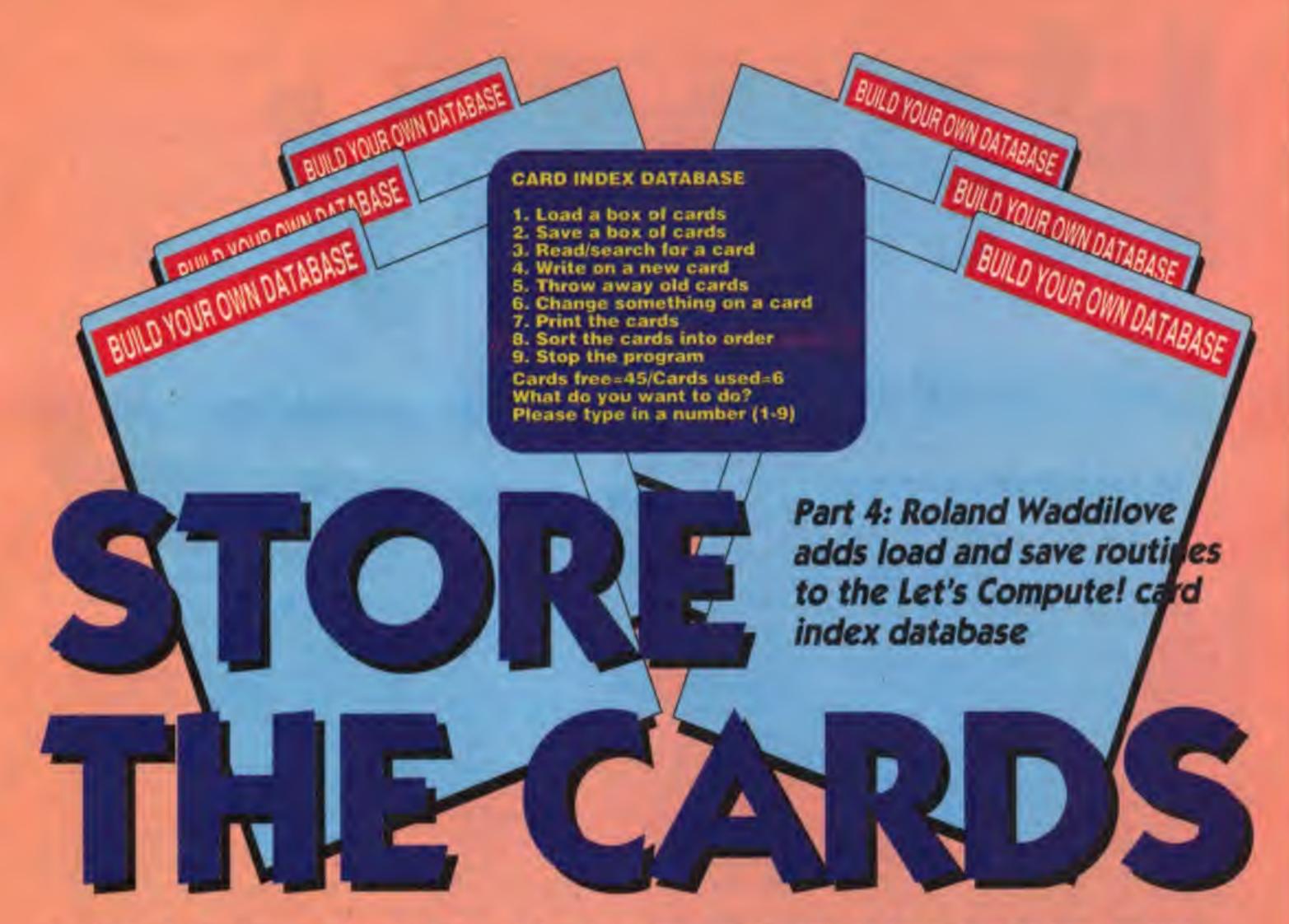
Change the following lines.

1868 SPEN IS JON 18701 AS 81 1888 INPUTAT/CS(X) 1500 CLOSE AT 2968 SPEN FS (SR DUTPHT AS 81 2088 SPENFAL/CS(X)

# Amstrad CPC

Change the following lines:

1000 OPENIN IS 1000 IMPER NO.CECK) 1100 CLOSEIN 2000 OPENIN IS 2000 WEITE #1,CD(X) 2100 CLOSEDUT



In the last two issues of Let's Compute! we've built a simple database that lets us type in facts like phone numbers. The first article showed how the menu was made and last month you were given the part of the program that lets you write on the blank cards.

The problem now is that every time you want to use the database you have to type in the data all over again! It disappears every time you switch your computer off.

So this month's code makes your computer remember the facts and figures on the cards. You will be able to save them to tape or disc.

You need to add these two routines to the parts we've done already. So start by LOADing the program you ended up with last month.

Next you should type in the new lines. Then SAVE your program and try RUNning it.

You can now try choices 1, 2, 4 and 5 on the menu - see above. What you've got now is a useful way of storing facts. But there's much more to a database than that.

We'll add more next month.

# How the Load and Save routines work

separate routines. One to save the cards and one to load them back any

time you want to use them.

They are in Lines 1000 to 2110. Both are designed in a similar way. The only difference is that Load Cards reads the information in from tape or disc, and Save Cards writes it

Remember, the data is stored in the out. computer's memory in 255 strings called C\$(1) to C\$(255). On most computers, before you save these strings you need to open a file for output. Take a look at Line 2060.

We then use PRINT# to print the strings to tape or disc - Line 2080. This special form of the PRINT command is different to the one you usually use. Nothing shows on the

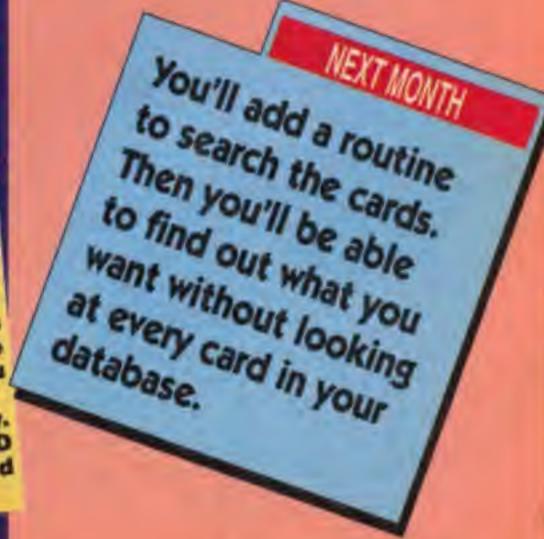
computer's display. It sends a message to the tape or disc instead. When all the strings have been

printed using a simple FOR ... NEXT loop the file has to be closed - line

In the Load Cards routine the data 2100. file is opened for input in Line 1060. A FOR ... NEXT loop loads the 255 strings making up the cards using INPUT# in Line 1080.

As you may know, INPUT makes the computer stop and wait for you to type in something. But INPUT# is different. It reads the cassette tape or disc instead of the keyboard - you won't see anything on the screen.

The Spectrum works differently. You just use special forms of LOAD and SAVE. Look at Lines 1060 and 2060.



Make your own computer calendar for 1991 - or any year you want

January 1 is the time to hang up your new calendar. So here's a program to let you print out your own.

It works for any year in this century - or the next. If you haven't got a printer, you can still use the electronic calendar and view the dates on your screen.

If you don't like the picture of Mabel - the Let's Compute! cat - you can design your own. The panel below tells you what to do.

Type in the program. SAVE it and RUN it. The first question you'll be asked is whether you want your calendar printed or just displayed on your screen. Answer P for print or S for screen.

Next, you're asked for the year. A good reply is 1991.

If you answered P to the first question your calendar will then be printed. If you chose a screen version, the cat will be displayed.

Press any key to see the first part of the calendar. There will be a slight pause while your computer works a few things out. Then the first few months will be displayed.

To see more, press a key again. (There will be no messages telling you to press a key. Just take our word for it!)

That's all there is to printing or viewing your own calendar.

If you've got a printer why not print out lots and give them to your friends?

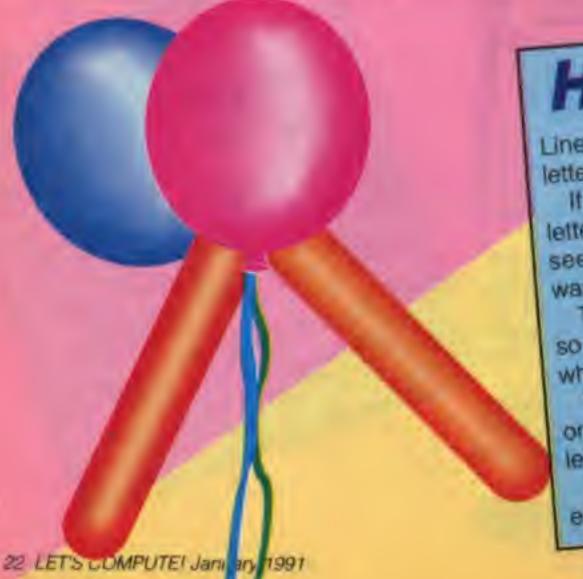


The Let's (

\*\*\*

000

\*00000\* \*0000\* 0000000\*



# How to change the program

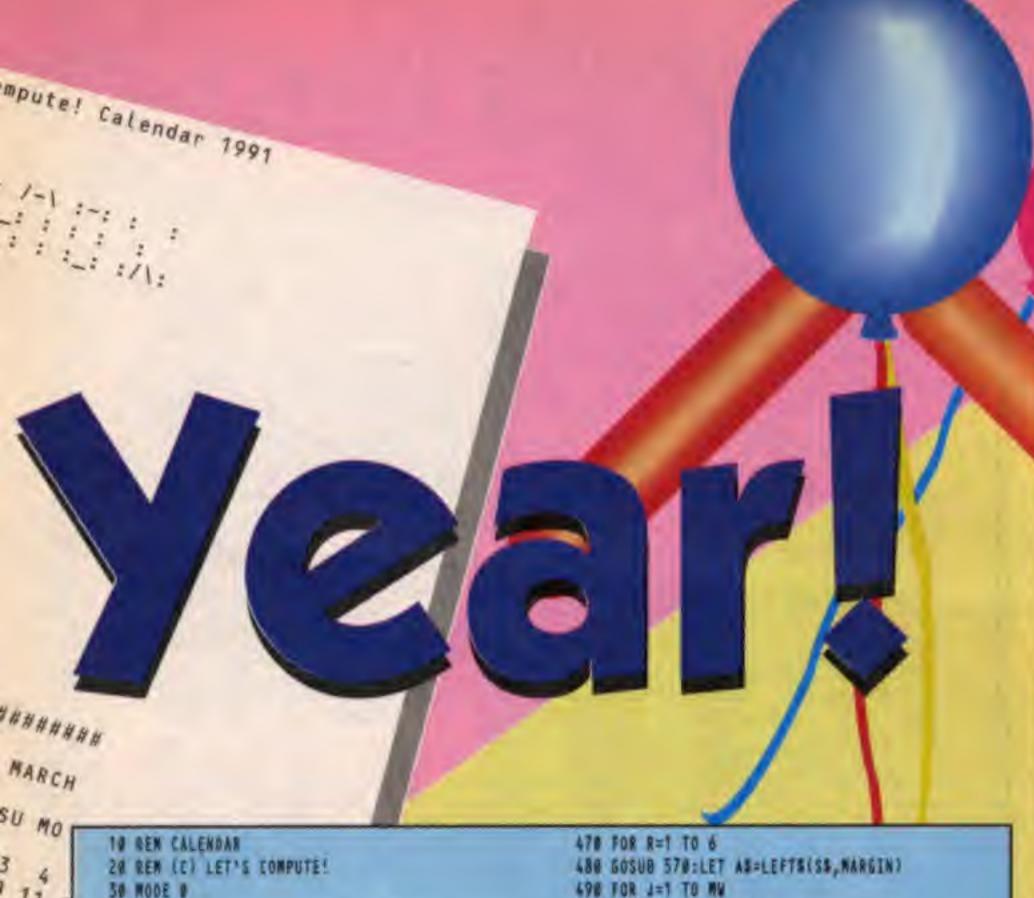
Line 40 sets the width of the printout. At the moment it is set to the number of

If you want to print the calendar - and you have a printer that lets you have more letters that will fit across the screen of your computer, letters on each line - you can change it. When you RUN the program, what you see on your screen will be messed up, but the printout will be just what you

The picture of Mabel is designed to fit on all common printers. It's 32 letters wide so it fits on the smallest computer screen or paper. If it's printed 80 letters wide the whole calendar will be 66 lines long - which is the most common paper size.

Would you like to put your own picture on the calendar? Design it using letters on your keyboard and put them in Lines 770 to 1000. If you use more than 32

letters in any line, change the number 32 in Line 150 to the most you use. You can make the picture as tall as you want. Just put more DATA lines near the end of the program. Make sure that you keep DATA "end" as the last line.



```
40 LET W=80
           50 LET SS=" ": FOR 1=1 TO 3:LET SS=SS+SS:NEXT
        I:REM THERE ARE THREE SPACES BETWEEN THE QUOTES
           60 LET MW=INT (W/Z4):LET MARGIN=INT ((W-Z4*MW)
        12)
           78 DIM #$(12):DIM T(12):DIM W$(6,3)
           80 FOR I=1 TO 12
TU W
           98 READ MS(1),T(1)
          100 NEXT I
          110 LET DS=" SU MO TU WE TH FR SA "
          128 INPUT "Printer or Screen (P/S)"; P$
8 19
          130 IMPUT "What year "; YEAR
5 26
          150 LET 8$=**: IF W>33 THEN LET B$=LEFT$(S$, INT
        ((V-323/23)).
          160 LET A$=85+"The Let's Compute! Calendar "+ST
        RELYEAR)
          178 60508 578
IE TH
          180 LET AS=" ":60SUB 570
          198 READ AS: IF AS "end" THEN LET AS=85+A5:60SU
      # 8 570:GOTO 190
          200 GOSU8 600
26 27
          218 LET T(2)=28
          220 LET Y4=INT (YEAR/4):LET SD=YEAR+Y4-7*INT I(
        YEAR+YA)/77
          230 IF YEAR=4*Y4 THEN LET SD=50-1:LET T(2)=29
          248 LET X=(50-1)*341
          250 IF She=0 THEN LET X=X+21
          268 LET MNTH=8
FR S
          278 REM
          28# FOR J=1 TO NW
13 14
          29# LET #=1
          JOO LET XS=LEFTS(SS,X)
7 28
          310 FOR E=1 TO T(MATH+J)
          326 LET T=INT (1/18)
          330 LET U=1-10*7+48:LET T=7+48
          340 IF T=48 THEN LET T=32
          350 LET X3=X5+" "+CHR$(T)+CHR$(U)
          360 LET $0=(50+1)
          370 LET X=(X+3)
          380 IF 1021 THEN LET X=1:LET
        WS(R, I)=LEFTS(XS+SS, 24):LET R=R+1:LET XS=" "
          390 NEXT I
          488 LET WS(R, J)=LEFTS(XS+SS, 24)
          410 LET R=R+1:1F R<7 THEN LET WS(R,J)=55:60T0410
          428 NEXT A
          ASE LET AS=" ":GOSUB 578:LET AS=LEFTS(SS, MARGIN)
          440 FOR J=1 TO MW:LET AS=AS+LEFTS(" "+MS(MNTH+J
        1+58,241:WEXT 1
          450 605UB 570:LET AS=" ":605UB 570:LET
        AS=LEFTS(SS, MARGIN)
          460 FOR J=T TO MU:LET AS=AS+OS:NEXT 1
```

18

6

```
490 FOR 1=1 TO MV
500 LET AS=AS+WS(R,J)
518 NEXT J
 528 NEXT R
 530 GOSUB 570
 540 SOSUB 600
 550 LET MNTH=MNTH+MW: If MNTH<12 THEN GOTO 270
 568 END
 570 REM PRINT AS
580 IF PS="P" OR PS="p" THEN YOUZ
 590 PRINT AS: VDU3: RETURN
 600 REM WAIT FOR SPACE
618 IF PS="P" OR PS="p" THEN RETURN
620 AA=627
630 RETURN
540 REM MONTH DATA
650 DATA "JANUARY",31
660 DATA "FEBRUARY", 28
678 BATA "MARCH", 31
680 DATA "APRIL", 30
698 DATA "MAY",31
780 DATA "JUNE", 38
710 DATA "JULY", 31
729 DATA "AUGUST",31
730 DATA "SEPTEMBER", 30
 740 DATA "OCTOBER",31
750 DATA "NOVEMBER", 30
768 DATA "BECEMBER", 31
770 DATA" /4\/4\"
780 DATA" ******
798 DAFA"\ **D**D** / :\/: : /-\ :-: : :"
800 DATA" SHOUSE : I : LITE I'
828 DATA" /** **1"
830 DATA" TERESE
842 DATA"
850 DATA" ****
869 DATA" *0000*"
878 DATA" *0000**
888 DATA" "000000"
899 DATA" "*cooc**
988 DATA" ***00***
910 DATA" BERGERSE
920 DATA" **==go==** ****
938 BATA" **==00==**
                     888"
                     ***
940 DATA" ##==00==##
                     100"
958 DATA" **==00==**
968 DATA" **==00==** g***
978 DATA"***=======**4*8*4"
986 DATA****==00==**#####
998 DATA" **nonnon***
1919 DATA"end"
```

# IS THIS YOUR COMPUTER?

# Spectrum

Change the following lines:

```
38 CL5
  AN LET W=3Z
  76 BIN MS(12,22):DIN T(12):DIN WS(6,3,24)
 150 LET 8$= "": IF W>33 THEN LET B$=$8( TO I
NT((W-321/21)
 198 READ AS: IF AS( TO 3) - "end" THEN LET A
$=8$+A$:GOSUB 570:GOTO 190
 300 LET XS-SS( TO X)
 388 JF X>29 THEN LET X=1: LET WS(R, J)=X5:
LET R=R+T: LET X$=" "
  ARE LET WS(R,J)=XS
 438 LET AS=" ": 509UB 570: LET AS=SS( TO MAR
GINA
 ALE FOR J=T TO MULLET AS=AS+" "+MS(MNTH+)
  45# 60308 57#:LET AD=" ":GOSUB 57#:LET AS=
S$( TO MARGIN)
 488 GOSUB 578:LET AS-SEL TO MARGIN)
 SAN IF PS="P" OR PS="p" THEN LPKINT AS: K
ETURN
 598 PRINT ASCRETURN
 628 PAUSE &
```

# Amstrad CPC

Change the following lines:

```
588 IF PS="P" OR PS="p" THEN PRINTES, AS: RE
TURN
 598 PRINT AS: RETURN
 628 MHILE INKEYS="": WEND
```

# Commodore 64/128

Change or add the following lines:

```
38 PRINT CHRECTAP);
AN LET W=AN:REM CHANGE TO BU FOR PRINTER
125 IF PS="P" OR PS="p" THEN OPEN 4.4
TAB PRINT EHRS(TAT);
535 IF P$="P" OR P$="p" THEN PRINTHA: CLOSE#4
580 IF PS="P" OR PS="p" THEN PRINTER, AS
598 PRINT AS: RETURN
628 GET AA
```

# PC(GW BASIC)

Leave out Lines 930 and 940. Change the following lines:

```
38 SCREEN 1:CLS
588 IF PS="P" OR PS="p" THEN LPRINT AS
596 PRINT AS: RETURN
628 WHILE INKEYS="": WEND
```

# Atari ST (Stos)/Amiga (Amos)

Change the following lines:

```
3# MODE 1: KEY OFF: CURS OFF: WIDE
588 IF PS="P" OR PS="p" THEN LPRINT AS
598 PRINT AS:RETURN
628 WRILE INKEYS="":WEND
For Amiga use:
 30 MOBE 1: CURS OFF: HIDE
```





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# LET'S MAKE MONEY! Part 2 Here's a great fund-raising idea that's well worth signing up

Everyone wants to know what's likely to happen to them in the luture. And there are lots of ways that claim to predict it.

Horoscopes, Tarot cards and studying handwriting are just a few of them. There are experts in all these fields. You can hire them to make money at your fund-raising event.

Of course if you do that you have to pay the person to do the job. But if you use your computer it costs you nothing!

The idea is simple. Sell people a printout of the predictions.

This month we'll look at how a school made money at a fair by analysing signatures. It takes about five minutes for each signature. So, selling printouts for 50p, they made almost £20 in three hours.

They also had lots of fun and laughs, it was easily one of the highlights of the alternoon.

What exactly did they do? And how much did they have to spend before they got started?

The software they used is called Handwriter Analysis. It's for the

PC and is on a Shareware disc called Personalities. You can get a copy for £2.50 from Shareware Marketing (0297 24088).

A PC and printer were set up at the fair and the program was run. It asks 13 questions about a person's signature,

The questions are all simple to answer For example, is the signature underlined?

The person running the stall just asks the customer to sign a bit of paper and then tells the computer the facts. It's a good idea to practise a few before trying it out at a fair.

You can get extra help about any question by typing **H** for help.

Look at these help screens on your test runs. When you do it for
real you'll appear professional and won't need any more help.

Once all the questions have been answered, you can get a printout ske the ones shown below. You can then sell them to the amazed customer.

That's all there is to making a few pounds at your next fundraising event. Try it. It's great fun too.

# What is Shareware?

The person who writes a program is its owner in other words, the author owns the copyright.

Some authors say they don't mind people having their programs for free. That's called **Public Domain** software.

Once you have it you can give it to anyone you want. But you shouldn't sell it for a profit

You can buy Public Domain software. That may sound silly after what we've just said. But what you're buying is the disc it's on, and paying for things like post and packing.

Shareware is often mixed up with PD. But it's not the same thing If you like the program when you've tried it you are asked to pay a small charge.

The program itself tells you where to send the money. If you do this and pay more you'll receive extras.

Sometimes the program you get at first is a cut-down one. If you pay up you'll get the lot. This could include the full manual. Some companies send you free updates if they change the program.

# Ram

Handwriting Analyst Report for Ram on 11-30-1990
Copyright 1986, 1988 by Ciasa, Berkeley, California
This report is based only on Ram 's signature and therefore
describes the way he wants others to see him. This may not be the
way he really is. Physical & Material Drives
way he really is. Physical & Material Drives
Ram has a zestful attitude with a lot of vitality.
He eagerly seeks physical and material pleasures. He can be
thrifty.

# Rom

Handwriting Analyst Report for Rom on 11-30-1990
Copyright 1986, 1988 by Ciasa, Berkeley, California
This report is based only on Rom 's signature and therefore
describes the way he wants others to see him. This may not be the
way he really is.

Physical & Material Drives
Rom can be thrifty.

Rom is more intuitive than he is logical.

15 State 1001 25

# It's time to

The listings in Let's Compute! are quite short and very easy to type in. Even so, once your program is working you don't want to have to key it in every time you went to use it.

So you need to save it on a tape or disc. It's then ready to load again anytime you like.

Tapes and discs are two ways of storing computer programs and data. They're called backing stores.

As we've said over the last few months, computers work in binary numbers. And it's easy to record these on a tape.

ne numbers can be shown by either a short beep or a slight gap. If you play the tape from a computer on a normal cassette player you hear a high pitched whistle. But if you have a recorder that can let you play it slowly you'll clearly hear the beeps and gaps.

Discs are recorded in a similar way. The information is stored on a first magnetic surface made of a similar meterial as a tape.

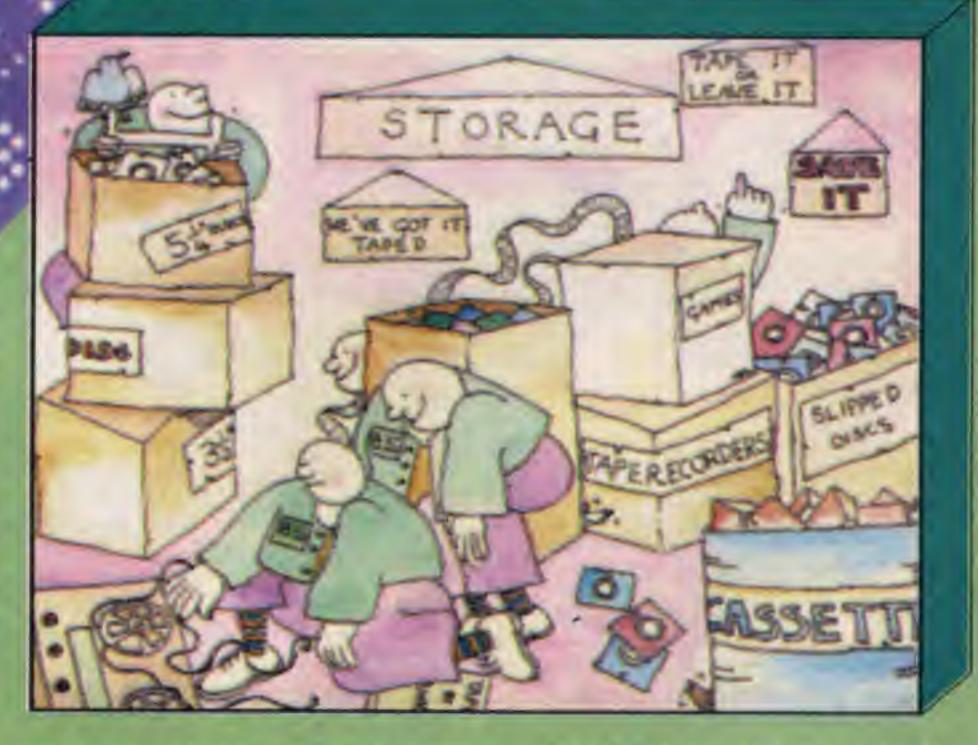
The date is stored in evervidening circles on the disc - like ripples in a pend. Formatting the disc prepares these circles.

Discs spin round very quickly much faster than tapes. That's why discs take loss time to load programs than tapes.

Another advantage is that the read/write head - which collects the data - can move straight to a circle on the disc. Which makes it very quick to find a program. With pight holes you can show 127 tape, the head stays still and a lot of tape may have to pass it until your program is found.

These are just two forms of storage device. There are lots of others.

On office computers paper tape used to be a common form of



backing store. The binary numbers are recorded by holes punched in the tape.

Paper tape is rare on computers these days. But the background to this page shows what it looks like. You can clearly see the holes that translate into binary numbers.

You'll see that each row has up to eight holes. There's also a line of smaller holes - these are just there so the machine can pull the tape through.

Using just seven of each row of different binary numbers. That's more than enough for the numbers 0 to 9, letters a to z and letters A to Z.

The eighth hole has a special use. The computer uses it to test whether everything has been reed correctly.

Moving from the past to the present - and future - another way of storage that is becoming more popular is the CD rom. For home computers, these are still rather expensive. They are only used for reading - the word ROM stands for Read Only Memory.

They work in the same way as a normal CD player: A laser light is used to read the zeros and ones.

Optical disc drives work in a similar way but you can also record on them.

The discs have a surface that looks like a CD.

The big advantage of optical discs is that you can store much more on one disc. They're also less likely to get damaged.

But they're still very expensive and not used on home computers yet. It won't be long before they



# BINARY BITS

Last month we saw how easy it is to add two numbers in Binary. For similar reasons it's also easy to take away in binary.

What about multiplication and division? The simple answer is that a computer can't do them.

But, as multiplication is really only repeated addition, it gives the impression that it can, If you ask a computer to do 4x7 it will work out 7+7+7+7.

For division, a computer sees how many times it can take away. For example, if you ask it to work out 21+7 it It starts subtracting, like this: 21-7=14, 14-7=7, 7-7=0. That means that 7 can be taken from 21 three times so 21+7=3

All these processes are easier in binary because there are only two numbers to worry about. So, why don't we use binary in our everyday life?

The answer is that binary numbers are too long for humans to work with. Look at the same sum done in both decimal and binary.

Decimal	Binary
45	101101
67	1000011
112	1110000

But there is an in-between way? It's called hexadecimal or Base 16.

That means that, instead of using ten numbers (0 to 9) we use 16. The numbers 10 to 15 are represented by the letters A to F.

In hexadecimal, instead of 45 meaning 4 Tens and 5 Units, it represents 4 Sixteens and 5 Units (that's 69 in decimal)

Some computer books put & in front of the numbers to show they're in hexadecimal. Others put \$. So, what decimal number does &BC represent?

The letter B is 11 and C is 12. That means &BC is 11 Sixteens and 12 Units. That's 188 in decimal. Hexadecimal numbers are even shorter than decimal.

Why did we say that hexadecimal is an in-between way? Why do computer experts use it?

The main reason is that it's very easy to convert between binary and hexadecimal.

The digits making up the binary number are called bits (Binary digITS). All you do is group the bits in fours starting at the right. It doesn't matter if there are less than four in the last group. Then convert each set into a hexadecimal number alone.

So 1011101 splits to 101 and 1101. Then 101 is 5 and 1101 is D.

This means that 1011101 in binary converts to &5D.

So while computers work in binary, programmers think in hexadecimal. It's then easy to convert between the two systems.

# PRIZE WINNERS

Our mailbags have been packed with entries to November's Win a Disc Drive contest. Well done everyone who got the right answers!

The first four entries to be pulled from our sack were: C Markwell, Ipswich; Matthew Anderson, Dorchester; Chris Williams, Elworth and A McNeil from Shieldaig. Each will be receiving a Cumana disc drive for their computer.

In case you're wondering what the right answers are, they're here:

# What does MSdos stand for?

Microsoft Disc Operating System

Why are keyboards know as Qwerty? They are the first six letters on a keyboard

Which country did Atari and Commodore start? USA

IBM has a nickname. Which one is it? The Big Blue

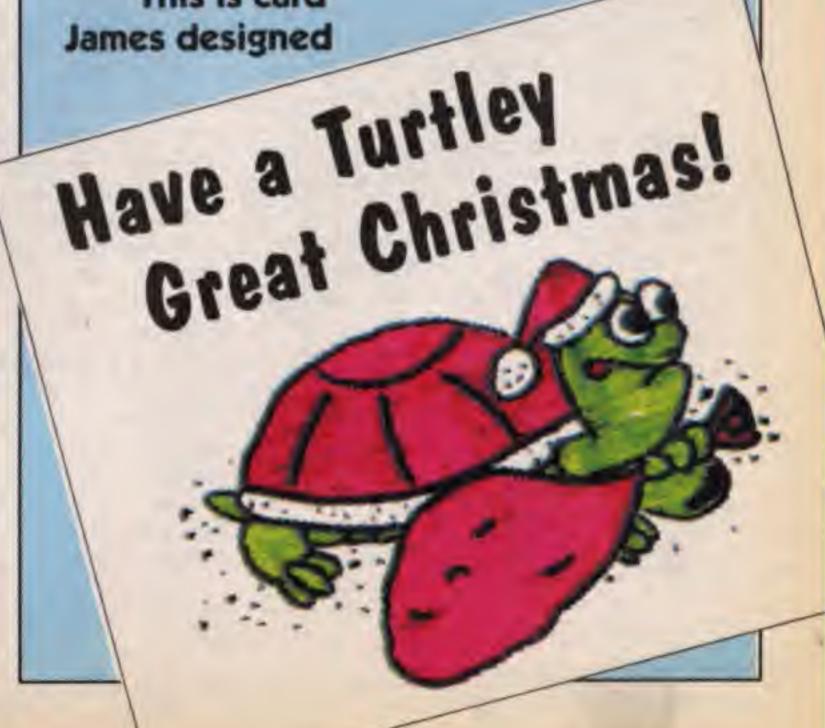
Each letter in the Word Basic stands for a word. What are they?

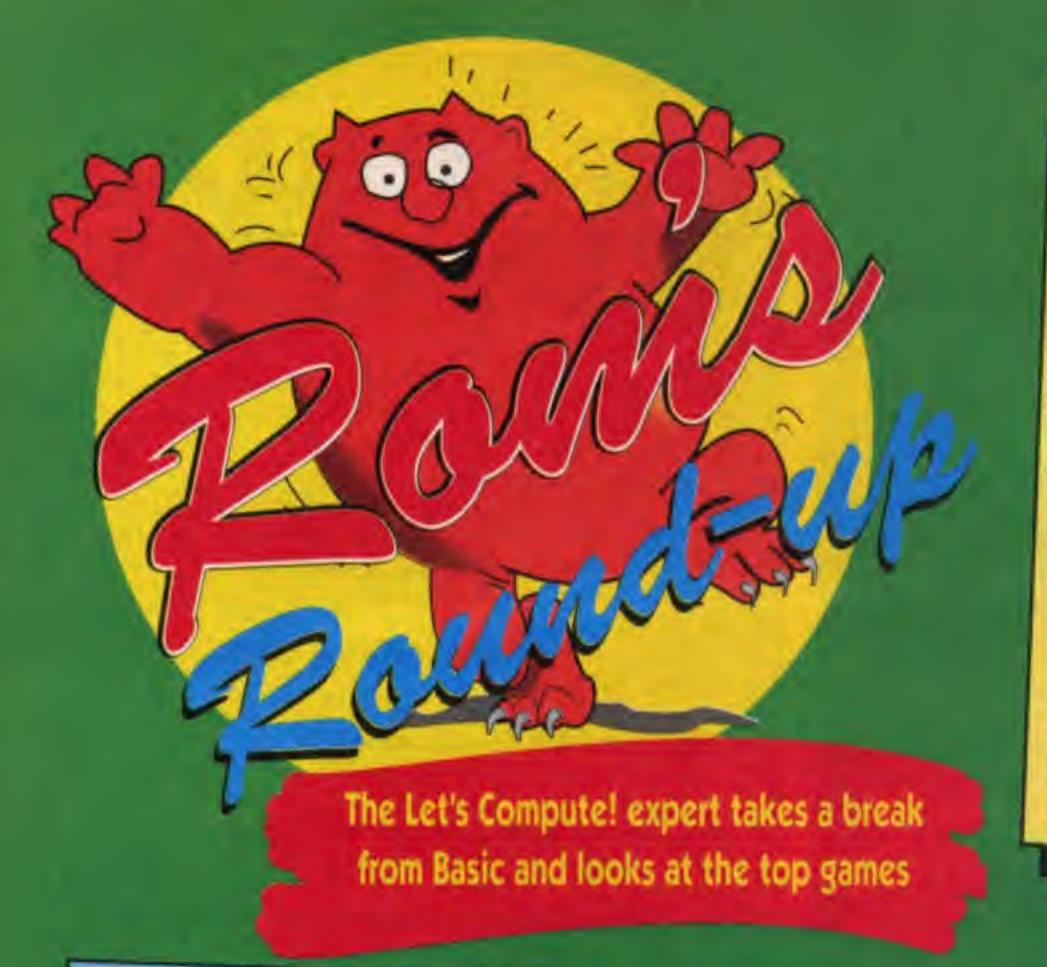
Beginners All-purpose Symbolic Instruction Code

Also in the November issue of Let's Compute! we asked you to create your ideal Christmas Card. It was very hard to choose between the many superb and artistic entries we were sent.

Our team of judges decided that the prize of 50 Christmas cards should go to James Jagger (12), from Welton, Lincoln.

This is card





# Shadow of

When Psygnos is released Shadow of the Beast a year ago it made people look at the Amiga in a new light. At last they've now converted the game to the Atari ST. And I'm pleased to say that it's hardly suffered.

At the same time Gremlin have also released Beast for the Spectrum, C64 and Amstrad CPC.

The gameplay is very similar for all computers. But obviously the graphics change for each machine.

The ST version is very similar to the Amiga one. There are fewer colours, but it still has the lovely parallax scrolling. That's where different parts of the screen scroll at different

# Wheels of fire

Here's a brand new compilation from Domark. It's called Wheels of Fire and features, suprisingly enough, a collection of four racing games.

Domark have only ever released one racing game themselves. It's called Hard Drivin' and is one of the four.

The other games are Turbo Outrun from US Gold, Chase HQ from Ocean and Power Drift from Activision.

Despite all the games being based on some kind of car racing they are all quite different. And a good thing too! No one wants to pay £30 for four games that are exactly the same.

Turbo Outrun is named after the infamous Outrun. But it doesn't resemble the original at all.

You drive a Ferrari F40 across the United States. The idea is to bash other cars off the road and have a wild time.

Nice graphics and some good sound tracks help the game along. But I prefer the next one the list: Chase HQ.

This has another nice simple plot. Drive along as fast as you can on the lookout for criminals.

They're not that hard to find because a huge great arrow appears over the top of them saying: CRIMINALS HERE! When you spot

one you simply smash your car into the side of him. With plenty of levels and even better graphics this is my favourite of the four.

It's just so addictive! Lots of speech too, which helps no end.

Next is Hard Drivin', which differs from the first two completely. This is more of a car simulation. It features solid 3D shapes.

There's no plot as such. You just drive round one of two tracks against the clock.

The best feature is the action replay. When you drive too fast off a broken bridge you get to see an outside view your crash. Superb! This is the first time Hard Drivin' been seen on the C64. It was specially written for this package.

Lastly is Power Drift. This was a big success in the arcades because of its huge graphics and great sound effects.

Sadly both of these are gone from the home computer versions.

It leaves a severely cut down game. Still good fun, but really overshadowed by the other three.

The cost? £29.99 for the Atari St and Amiga and £14.99 for CPC, C64 and Spectrum tapes.

All in all this is a superb package.

One of the best I've seen from Domark.



# the Beast

speeds to give the feeling of depth. However on all versions there is one vital element missing - the all important gameplay! Beautiful it may be, but it's also very very boring.

You get killed too easily. Or is it because I'm useless? There's far too little action for my money.

The 8 bit machine versions don't even have enough sound or graphics. They really aren't worth the money.

The ST version (Psygnosis) costs £24.95. C64, Spectrum, and Amstrad (Gremlin) are £9.95.

Atari ST owners can buy it for a great demo of their machine. But other than that I wouldn't bother.





# Gold of the Aztecs

There are some very impressive technical bits and bobs in Gold of the Aztecs. It's from US Gold and there are versions for the Atari ST, Amiga and PC.

You play the hero. And there more than 1,500 frames of animation, over 600k of music and it's all taken three man years

You are Bret Conrad, bored penniless. By some stroke of fortune you have found a map of an ancient Aztec temple. It's filled with gold. So off you trot to find all this lovely wealth.

But everything you see on screen is out to stop you. Gold of the Aztecs is a back and slash of the best kind. There's plenty of action and a bit of thought too.

The graphics are good but, most importantly, the gameplay is great. It's a first rate game and should do well.



# Plotting

Are you keen on strategy? Then take a look at Plotting from Ocean.

You and a friend play against each other. You can also challenge your computer - but it's your friend too, isn't it?.

The object is ever so simple: Just get rid of a few blocks lying around the screen.

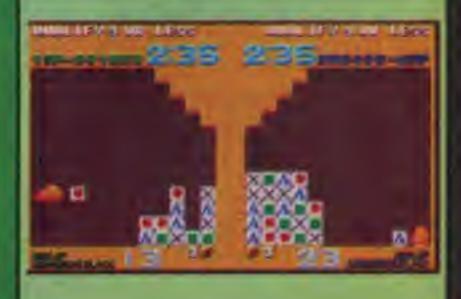
But the way to do this is really devious. Moving one block throws another at you. But bashing that block may get rid of five others.

It's all good clean fun. And there are lots of lovely backdrops and great effects too.

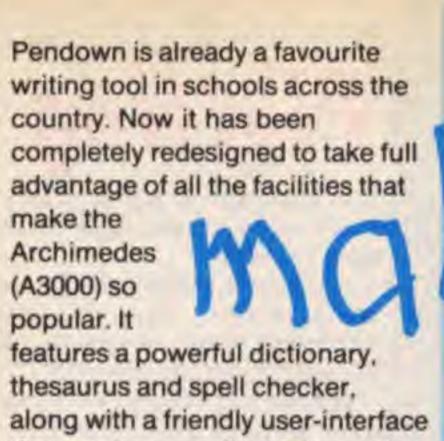
There is an added bonus on some computers. A screen editor is included to let you design your own series of blocks.

You can get Plotting for the Spectrum, C64, Amstrad CPC, Atari ST and Amiga. It's £9.99 for 8 bit tape, £14.99 for disc, and £24.95 for the Atari ST or Amiga.

Plotting is well worth the money because you'll always be in the mood for a game. Provided your blood pressure can stand it!







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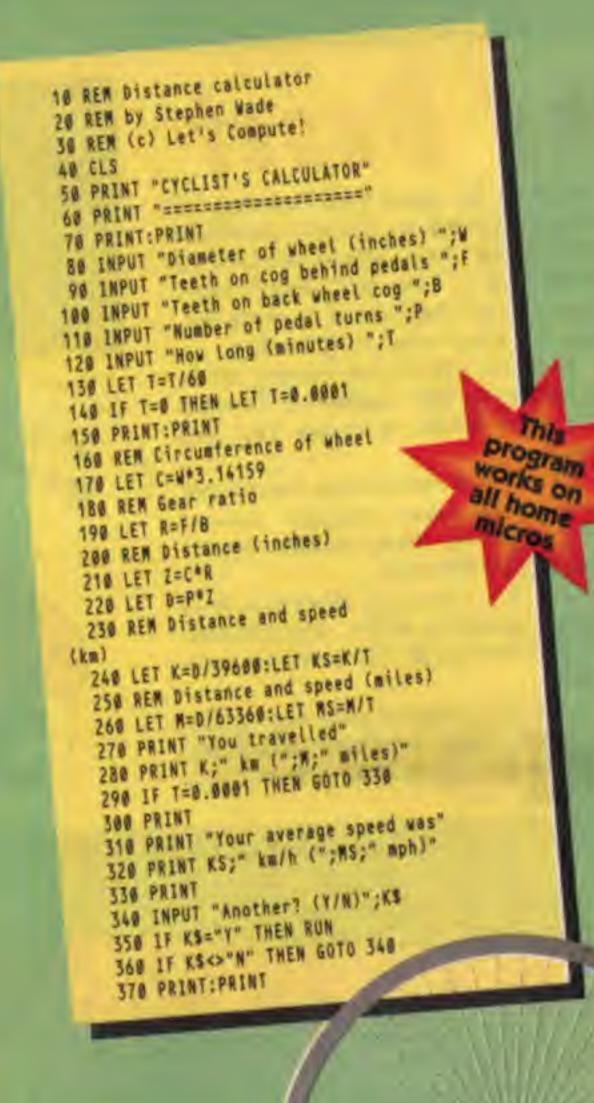
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# IS THIS YOUR COMPUTER?

BBC/Electron/Archimedes/ PC (GW-Basic)/Amstrad CPC/ Spectrum

The listing works as shown.

# Commodore 64/128

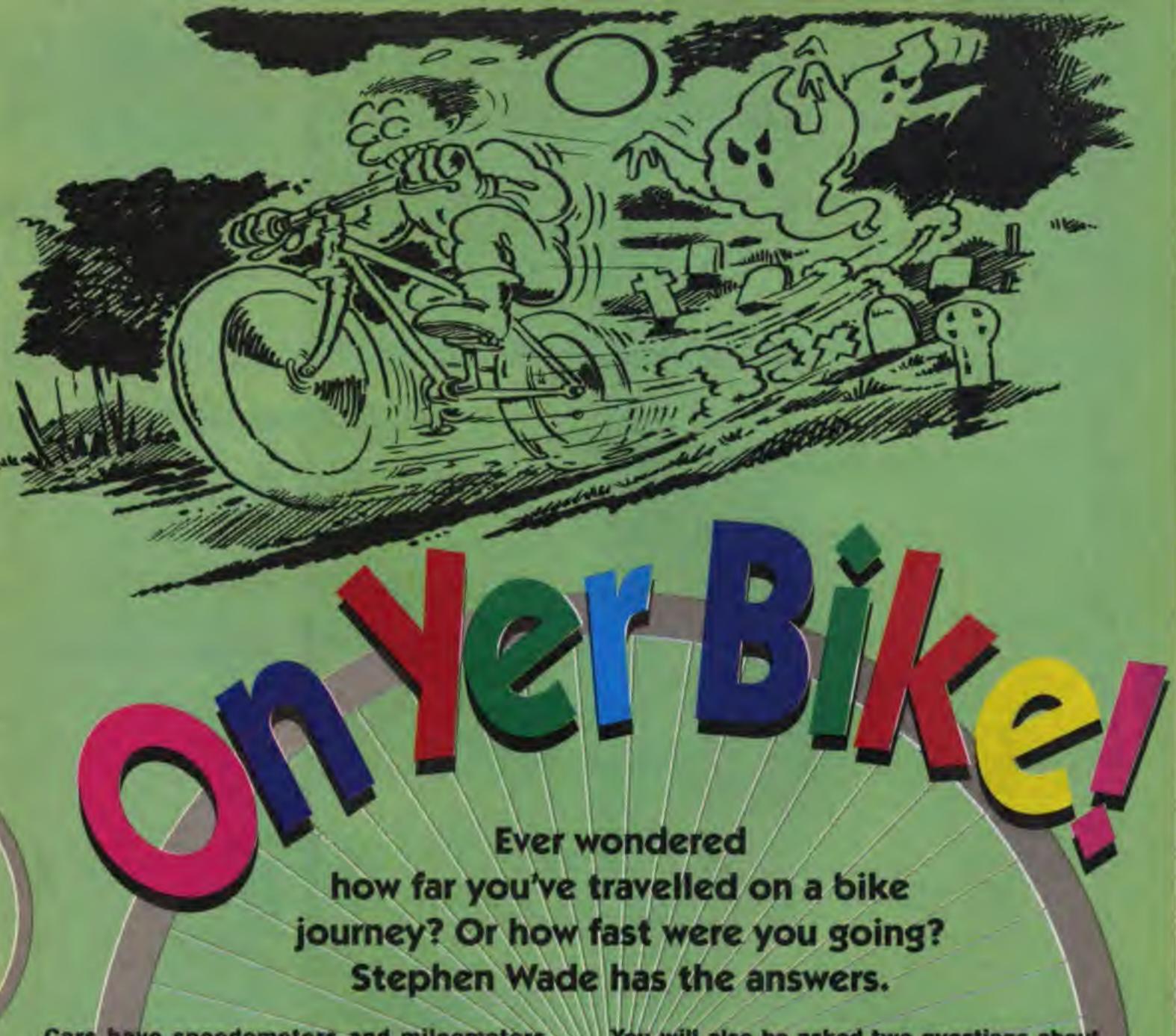
Enter the program in capitals. Change the following line:

48 PRINT CHR\$(147);

# ST (Stos)/Amiga (Amos)

Put a # after all the variable names except K\$. For example, change Line 170 to:

170 LET R#=F#/B#



Cars have speedometers and mileometers.
But not many bikes do. So how do you work
out how far you've travelled and at what what
speed?

Use your computer! All you need is the Let's Compute! Cyclist's Calculator. It works for any bike that doesn't have Sturmey Archer gears.

Type in the program and SAVE it. When you RUN it you'll be asked for some numbers. Have the following answers ready and type them in when you're asked:

- The diameter of your wheel. This is the distance from one edge to the opposite one. Measure it in a straight line across the centre.
- The number of teeth on the cog behind the pedals. If you've several cogs there, note each so you can use the program for any gear. If you're lucky the numbers may be in your cycle owner's manual. It's worth checking there first.
- The number of teeth on the back wheel cog. Count these, like you did for the front.

You will also be asked two questions about the journey you are checking.

- How many pedal movements did you make?
  Once up and and down with one leg counts as
  one movement.
- o The time taken. To work out your speed, your computer needs to know how many minutes you took.

Sometimes you may not be interested in the speed. You might just want to use the program to work out the distance between two places. In that case, enter zero when your computer asks for the time taken.

Once your computer knows the facts it will quickly tell you how far you travelled in both kilometres and miles. If it also knows the time taken it will also tell you your speed.

Experiment with the program. Try out different gears and see what happens to your speed.

But be careful. If you try any speed trials on your bike make sure you do it in safety.





Find a brand new use for your damaged old discs - and try to WIN some new ones!



You should always take care of your computer discs. Especially the bendable 5.25in ones. But accidents do sometimes happen!

We've heard of discs that have been sat on. Some have been chewed by dogs that find they taste nicer than frisbies. There are even stories of discs being folded to fit through a letterbox.

But these damaged discs could still have their uses.

Ace cartoonist Mike Goldberg has come up with a whole host of ideas. Some are shown on this page. Can YOU think of any better ones?

You could win a prize which any disc owner shouldn't be without. Inmac are giving away 10 packs of 10 5.25in discs and 10 packs of 3.5in ones. They are also offering five red and five blue disc boxes. With your own supply of discs and a place to keep them safe you need never be a bent disc sufferer again.

So fill in the entry form now!

# What you have to do

On the entry form is a list of five important things to do to keep your discs sate. Put these in the order you think is the most important from 1 to 5. Then think of one unusual, original and furning use for a bent disc.

Either draw a picture or tell us your idea. You could see YOUR picture or a Mike Goldberg cartoon of your idea in

a future Let's Compute! Fill in the entry form and ensure that it reaches us before January 3 1991. The 30 correct entries with the funniest tie-breaker to be pulled from the sack will receive one of the many prizes.



ENTRY FORM A. Keep discs in their sleeves Answers: B. Don't leave discs in the drives C. Don't use discs as drink mats D. Keep discs out of hot sun E. Always store discs safely Name:.... Address..... 5..... The funniest use for a bent or broken disc is (no more than 15 words or one picture): manufacturation and a community of the c Post Code.....Age..... Now send this to: Let's Computel Disc THE RESIDENCE OF THE PERSON OF

Contest, Europa House, Adlington Park,

Macclesfield SK10 4NP.

LET'S COMPUTE! January 1991 33

I have a 3.5/5.25\*in disc drive

(\*Delete the one that doesn't apply.)

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# Mijas Software by Berry and Meekings

The New Issue of 'A Book on C' £11 inclusive

# Small C System £69 (inclusive of VAT p&p)

Use the Mijas Small C System on the BBC B or MASTER series computers for games, educational and industrial software. Small C programs run up to 12 times faster than in BASIC. Your code is highly portable and can be recompiled to run on the ARCHIMEDES or R140 using the Acom ANSI C compiler (not supplied) and on many other machines. You can also use the power of the ARCHIMEDES for the rapid development and test of BBC B or MASTER programs, Manuals and post sales support included.

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Available for the MASTER series Computers, BBC B+ or B with sideways ram, and ARCHIMEDES. Software supplied on 80T double sided 5.25" or 3.5" ADFS or DFS disk. The ADFS disk contains the SHELL source code. The system is also available for other hardware configurations, including systems for the Mitsubishi MELPS processors, please write for details.

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\*Includes original Small C code supplied at the cost of distribution

# IS THIS YOUR COMPUTER?

# Electron/BBC/Archimedes

The program works as shown

# **Amstrad CPC**

Make the same changes as for the Spectrum to Lines:

298,320,340,420,480,500,610

Change the following lines:

40 INK 0,0:1NK 1,2:1NK 2,6: INK 3,8: INK 4,18: INK 5,28: INK 6,24: INK 7:26: MODE 8:PEN 7 688 WHILE INKEYS="": WEND 650 LOCATE X+1, Y+1: PRINT AS

# ATARI (Stos)/ Amiga (Amos)

Make the same changes as for the Spectrum to Lines:

290,328,348,420,480,588,618

Change the following lines:

40 MODE RECURS OFFEKEY DEFE

45 COLOURS, \$700: COLOURZ, \$7: COLDURA, \$78: COLOURS, \$787: COLOU R5,\$778:COLOUR6,\$77:COLOUR7,\$7

600 WHILE INKEYS="":WEND 658 LOCATE K,Y:PRINT AS

Amos: Leave out KEY OFF in Line 40

# Commodore 64/128

Change the following lines:

40 POKE 53288, 8: POKE 53281, 0:PRINT CHR\$(147); 45 FOR N=1 TO 7:READ A:C\$(N )=CHRS(A):NEXT N 50 LET W=38 68 LET 5\$=CHR\$(18)+" PAC. RRS(146) 290 PRINT C\$(C3); 328 PRINT CS(C3+C1); 340 PRINT CS(C3+C2+C1); 360 PRINT (\$103+02); 428 PRINT CS(C1); 486 PRINT CS(C1+C2); 500 PRINT CS(C2); 688 GET AS: IF AS="" THEN 688 618 PRINT CHR\$(147); 658 PORE 211, X: POKEZIE, Y:SYS 58732: PRINT AS: 1008 DATA 28,38,158,31,156,15

# Spectrum

Change the following lines:

48 BORDER B: PAPER 9: INK 7: CLE 50 LET W=32 290 PAPER C3

320 PAPER C3+CT 348 PAPER C3+C2+1 360 PAPER ESHCZ

428 PAPER CI 480 PAPER C1+CZ SEE PAPER CZ

570 IF B\$(\$) 4> " THEN LET 5=5-1:6010 379

580 LET AS=BS( TO 3-1): LET 81:81(547 10 )

600 PAUSE 0 BIR PAPER B: ELS

650 PRINT AT YAZAS

# PC (GW Basic)

Change the following lines:

AN ADDRESS BOOKS SE BET WHEN

AT LET SEATTRINGS (4,219) THE LET CT INCOMES AND

I'VE LET CONTROLLS LYA AND RECORD OF THE RATE

ZER ATT CZ-1-SONIS AVA

THE LET CHER : GOING ATM 238 LET -02-1:60508 479

TOR LES MINNUET STRANGET CT. 4 : ROSII 8 424

276 187 X3=8;187 F1=8:187 CA 2:50YUE 488 C) TEATHERTY TRANSPORT (3.

296 COLDS GOVE

374 COLOR (345148) THE COLOR EDICZICION

SAME ASSESSED A TRANSPORTE **428 370F** 

ADD VOLUM STAKE ARE COLOR CTYCZNE

SAP EBPOX ESAX

688 LES GREINIETRINGLES SEC-

LET SECHMENATIONERS BURNEY, SPARE SEE

NOW LUXBURY VATIONAL PRODUCT AND

# The Safe Scientist looks at what happens when you...

Hi there again. This month we're looking at how coloured lights behave.

Imagine some projectors shining coloured squares on to the back of your computer screen. Where the colours mix you get different colours.

Our program shows what happens. The colours from our imaginary projectors are called primary colours.

Where two or more mix they create what are called secondary colours.

It's like mixing paints to make new shades. But note something strange.

The colours you get when you mix lights are different to what you get when you mix paints.

Type the program in, SAVE it and RUN it. After the intro screen you'll see two overlapping areas of primary lights.

Where these cross you'll see the secondary colour. Press the spacebar to see other pairs of colours and their mixes. When the three possible

combinations of two primary lights have been tried all three primary colours are shown at once. Now you can see what happens when all three overlap.

Why should we want to mix coloured lights? Well it's happening all the time inside your TV set. Millions of different colours are being created all the time.

TV show would look very dull indeed.

As our program shows, red, green and blue can be mixed by your computer to give other colours. But this is only the start. It's well worth you investigating more about colours yourself.

If you add secondary colours together you get even more. You can also subtract colours.

Next month get your seat belts ready. We're off to study gravity! And you'll have the chance to touch down on any planet in the solar system!

# WHAT GOES ON IN A TV TUBE?

This program gives you an idea how your TV set works. At the back of the tube there are red, green and blue "projectors" - called electron guns.

When these fire at the screen coloured dots light up. The dots are so close that if, say, a red and blue one light up next to each other you see purple.

Every picture you see on your screen is made up from these primary colours. But your TV set can do more with them than our simple program can. It can give the three colours different degrees of brightness.

This means that, for example, they can mix bright green with dull red.

```
18 REM COLOURS
   20 REM BY THE SAFE SCIENTIST
  38 REW (c) LET'S COMPUTE!
  48 MODE 2
  58 LET W=28
  6# LET 5$=" ":REM & spaces
  78 LET A$="Primary Colours":LET Y=1:5
05UB 648
  30 LET B%="Some projector beams whine
onto a screen and overlap.":605UB 5A8
  98 LET B5="When colours merge they gi
we a new colour.":60598 540
 100 LET B$="The projectors shine out ?
n red, blue or green. ":605UB 548
 118 LET 85="These are called the PRIMA
RY colours. ": 60598 548
 120 LET BS="The new rolours are called
SECONDARY colours.": 60588 548
 138 LET BS="Let's lock at the secondar
g colours.": ROSUB 548
 148 LET BS="Missing Two Colours"
 158 GDSUB 688
 160 LET C1=1:60508 410
 170 LET 22=Z:605UB 470
 150 GOSUB 600
 196 LET C1=1:605UB 418
```

288 LET CZ=4:605UB 478

220 LET E1=2:605UB 410

210 SOSUB 600

```
234 LET 02=4:60508 479
  240 LET BS="All three colours."
  258 E05UB 688
  260 LET X1=4:LET Y1=4:LET C1=1:605UB 4
28
  278 LET X1=8:LET V1=8:LET CZ=2:605UB 4
  Z80 LET KT=#:LET Y1=8:LET C3=4
  298 COLOUR 128+C3
  300 LET AS-SS+SS:LET IS-S:LET IE-11:LE
T RS=0:605U8 446
  310 LET AS-SSILET IS-BILET IE-7:LET KS
-#:GOSUB 448
  32# EBLOUR 128+E3+E1
  338 LET X5=4:605U8 449
  548 COLOUR 128+63+62+61
  358 LET KS=8: 605U8 448
  36# COLOUR 128+C3+C2
  37# LET IS=8:LET LE=11:LET IS=8:605UB
AAE
  38# LET B$="Thet's all folks."
  390 605UB 600
  488 LET 35="":60SUE 598:RUN
  418 LET X1=Z:LET Y1=4
  428 COLOUR 128+E1
  430 LET AS=SS+SS+SS: LET IS=9:LET IE=1
TILET XS=#
  440 LET XS=XS+W/2-10
  450 FOR I=15 TO IE:LET MEXTAXS:LET Y=M
```

```
Now that's a really unusual colour!
1+1:60508 658:MENT 1
  460 RETURN
 470 LET X7=0:LET *1=8
 480 COLOUR 128+C1+52
 498 LET A$=85+5$:LET IS=0:LET IE=7:LET
 X5=0:605UB 440
 500 COLOUR 128+CZ
 518 LET AS-SSILET IS-BILET IS-TILET IS
=8:605UB 448
 526 LET #5=55+55+55:LET IS=3:LET IE=11
3LET KS=8:60SUR 440
  558 RETURN
  54g PRINT
 556 IT LEN (BS) CON THEN PRINT BS: RETUR
  568 LET S=W
 578 11 WIBS(84,5,1) - " THEN LET S=5
-1:6010 570
 588 LET AS=LEFTS(85,5-1):LET BS=MIDS(8
8,5+11
 598 PRINT A5:6010 558
 600 PRINT:PRINT"PRESS SPACE":AA=GET
 618 COLOUR 128:ELS
 628 LET V=0
 638 LET AS=85
 640 LET X=[NT ((W-LEN (AS))/2)
 650 PRINT TABLE, TICAS
 668 RETURN
```

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Hammerlist	4.99			11.99	NVA	NVA
Hostages	7.99	11.99	7.99	11.99	NA	N/A
Klax	7.99	11.99	7.99		7.00	
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Midnight Resistance	7.99 7.99	11.99	7.99	11.99	7.99	11,99
Monty Pythons Flying Circus New Zealand Story	7.99	11.99	7.99	11.99	7.99	11.09
New Zealand Story	7.99	11,99	7.99	11.99	7.99	11.99
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Pipemania	7.99	11.99	7.99	11.99	7.99	11,99
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Rick Dangerous	7.99	11.99	7.99	11.99	7.99	11.99
Robocop	7.99	11.99	7.99	11.99	7.99	11.99
Rainbow Islands	7.99	11.99	7.99	11,99	7.99	11.99
Satan	7.99	11.99	7.99	11.99	7.99	11.99
Shadow Warriors	7.99	11.99	7.99	11.99	7.99	11.99
Sim City	8.99	12.99	8.99	12.99	8.99	12.99
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Answer Back Junior Better Maths 12-16 Better Spelling 9-14 Fun School 2 Under 6 6-8 8+ Fun School 3 U5 5-7 7+ French Mistress Adv or Beg German Master	7.99 N/A N/A 7.99 7.99 7.99 9.99 9.99 6.99 6.99	9.99 N/A N/A 11.99 11.99 12.99 12.99 12.99 9.99 9.99	7.99 8.99 8.99 7.99 7.99 7.99 9.99 9.99	10.99 13.99 13.99 9.99 9.99 12.99 12.99 12.99 9.99 9.9	N/A N/A 7.99 7.99 7.99 9.99 9.99 9.90 N/A N/A	N/A N/A 11.99 11.99 12.99 12.99 12.99 N/A N/A

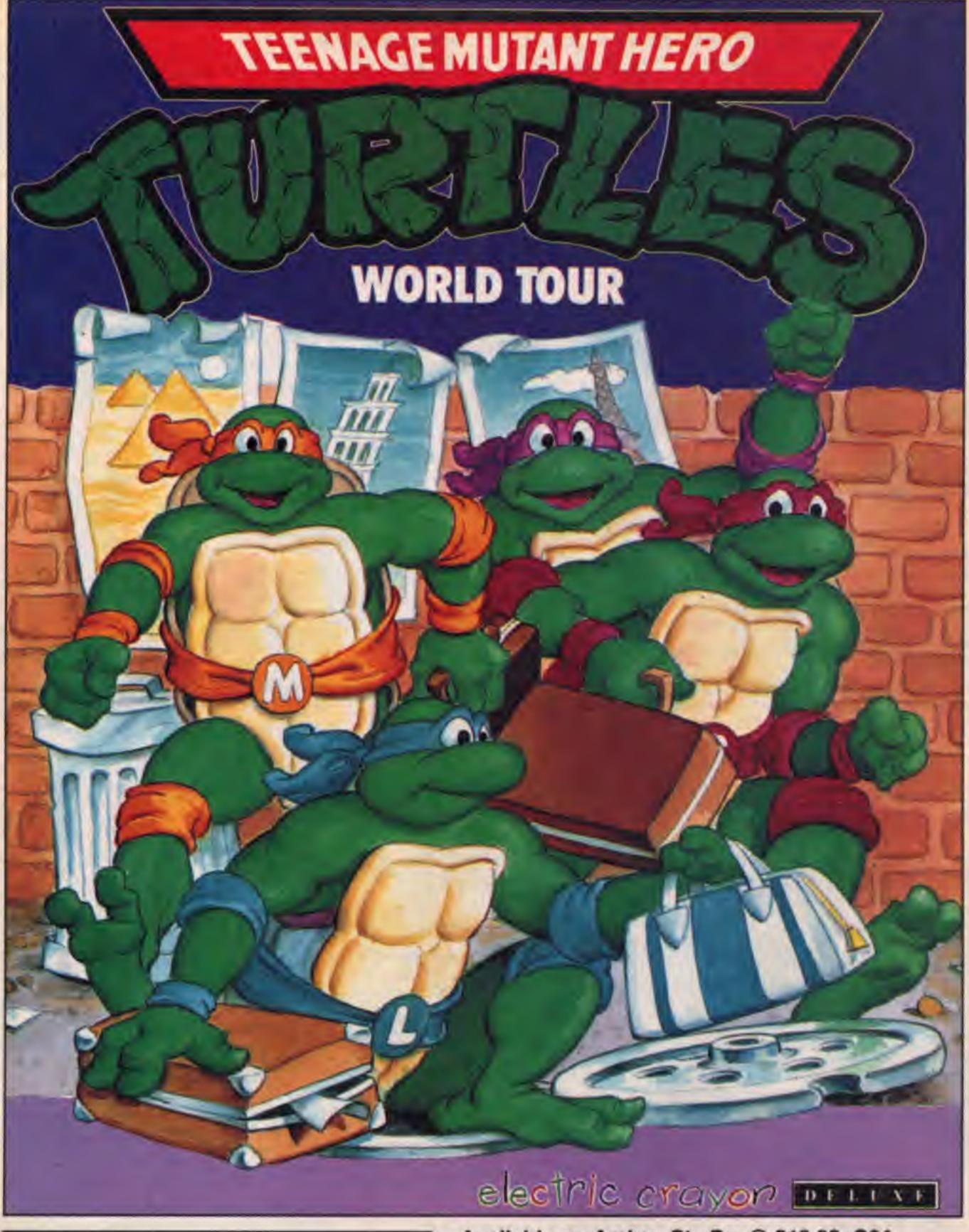
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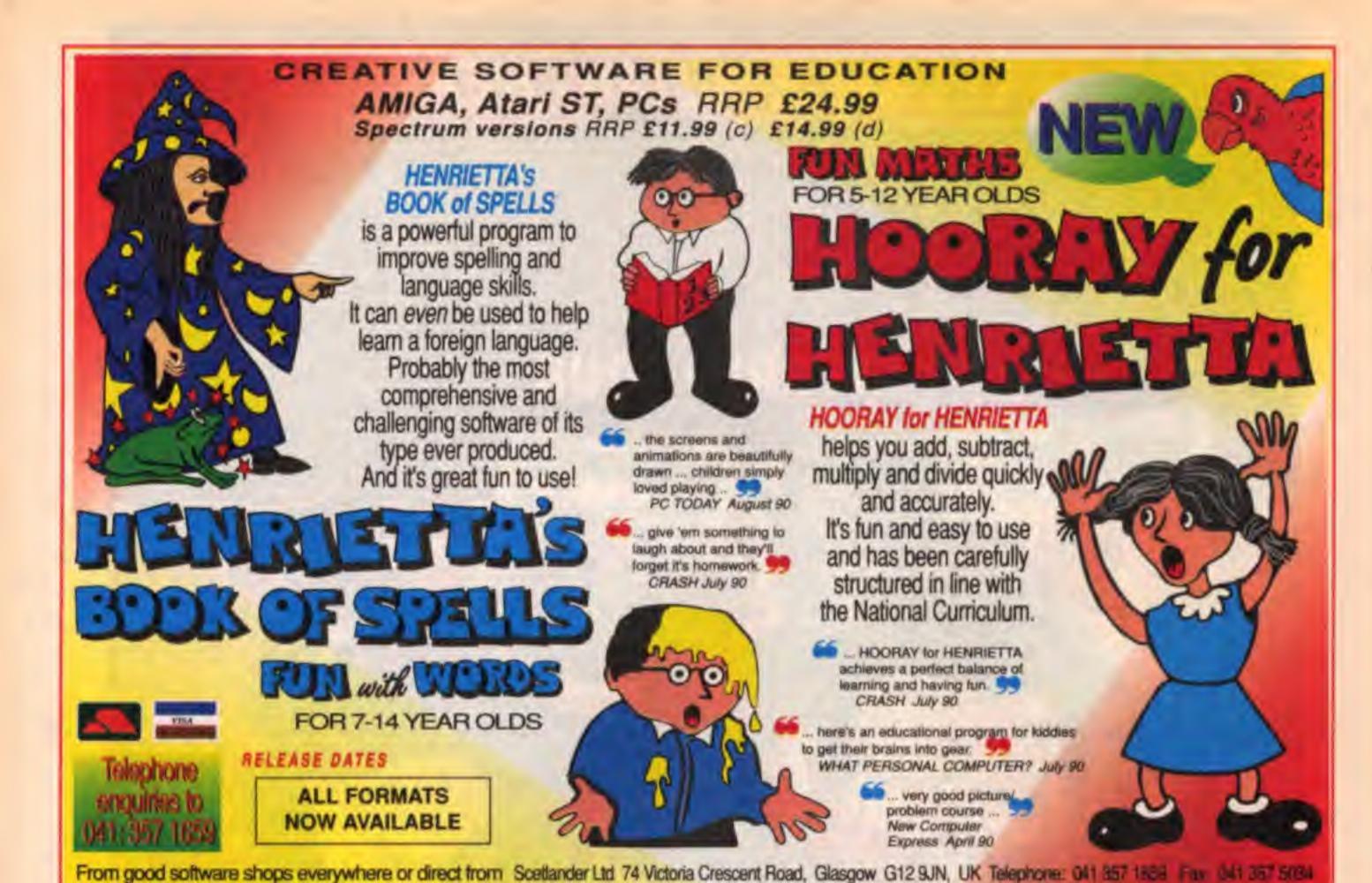
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There is more than one way to skin a cat. Our resident micro medic tells of three ways to save you jumping out of loops.

70/4 micros

program works on all home

Last month Doc operated on the program shown top right. It tests whether you know the alphabet. If you didn't try it last month, type it in and RUN it now.

It will seem to work as it is. But if you type the alphabet in the wrong order a few times you are likely to get an error message.

That's because each time you press a wrong letter the program jumps out of a loop.

Last month the Doc prescribed a cure to remove this problem. Now he looks at even better methods of doing the same job.

The one you should use depends on the Basic language fitted in your computer. At least one of the ways will work on YOUR machine. The plant of the right had you which you can use

First, let's describe the simple game in words. You have to REPEAT typing a key UNTIL you've gone through the whole alphabet OR have made a mistake.

If your Basic understands the commands REPEAT ... UNTIL and OR those words can be put into the program almost exactly as they are spoken.

The You've made a mistake part comes when a flag is set to 1. Remember, we used flags last month. So you can REPEAT the loop UNTIL 1526 OR F=1.

Note that REPEAT ... UNTIL loops don't automatically add one to I so Doc put let near the start of the program and lelet in the loop. All doc's changes are shown on the right.

Some versions of Basic don't understand REPEAT ... UNTIL but have another type of loop. It's called WHILE ... WEND.

Like the repeat type of loop it works as you would say it: "While the 26th letter hasn't been reached and a mistake hasn't been made keep looping". WEND is used to show the end of the loop.

Doc's second set of changes show what you have to do if you want to use this sort of loop.

But some Basics have neither WHILE ... WEND nor REPEAT ... UNTIL - see the panel to check which YOUR machine uses. So Doc's final changes show how you can do REPEAT ... UNTIL without actually having the instructions in your version of Basic.

In place of REPEAT put a REM to show it's the start of the loop, in place of UNTIL something happens you have to go back to the start of the loop if it hasn't happened.

So Doc has now shown four cures for the same problem. And there are plenty of others.

The main point to remember is that you should NEVER jump out of a loop.

## This is the original program:

TO CLS: REM C64 PRINT CHRS(147); 20 PRINT "TYPE THE ALPHABET NOV!"

30 FOR I = 1 TO 26

48 GOSUB 166

50 PRINT KS; 68 IF KS CHRS(1+64) THEN GOTO 188

80 PRINT:PRINT:PRINT "WELL DONE"

98 6070 118

100 PRINT: PRINT: PRINT "YOU GOT IT

WRONG"

110 PRINT: PRINT "DO YOU WANT ANOTHE

# 602" 129 GOSUB 168

130 IF KS="Y" THEN GOTO 10

148 PRINT: PRINT "BYE"

150 END: REM ON SPECTRUM USE STOP

168 INPUT KS

170 RETURN

## Here are the changes Doc made to the original program using REPEAT ... UNTIL:

25 LET F=0:LET I=1

30 REPEAT

60 IF KS<>CHR\$(I+64) THEN LET F

65 LET I=1+1

70 UNTIL 1>26 OR F=1

75 IF F=1 THEN GOTO 100

## Here are the changes Doc made to the original program using WHILE ... WEND:

25 LET F=0:LET 1=1

30 WHILE I <= 26 AND F=0

60 IF KS CHRS(1+64) THEN LET F

65 LET I=I+1

70 WEND

75 IF F=1 THEN GOTO 188

## Here are the changes Doc made to the original program to make his own REPEAT ... UNTIL:

25 LET F=8:LET 1=1

38 REM REPEAT

68 IF K\$ CHR\$ (1+64) THEN L

ET F=1

65 LET 1=1+1

78 IF 1 = 26 AND F > 1 THEN GOTO

30

75 IF F=1 THEN SOTO 100

## **IS THIS YOUR** COMPUTER?

## Electron/BBC/Archimedes

The Basic in these computers understands REPEAT ... UNTIL but not WHILE ... WEND.

## CPC/PC(GW-Basic)

The Basic in these computers understands WHILE ... WEND but not REPEAT ... UNTIL.

## Amiga and Atari ST

Stos and Amos understand both WHILE ... WEND and REPEAT ... UNTIL.

## Spectrum/

## Commodore 64/128

The Basic in these computers doesn't understand either REPEAT ... UNTIL or WHILE ... WEND.

Do you think YOU have written a program that can't be improved? Then send it along to the Program Doctor. He loves a challenge!

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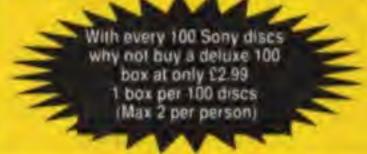
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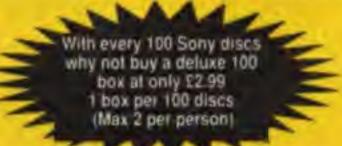
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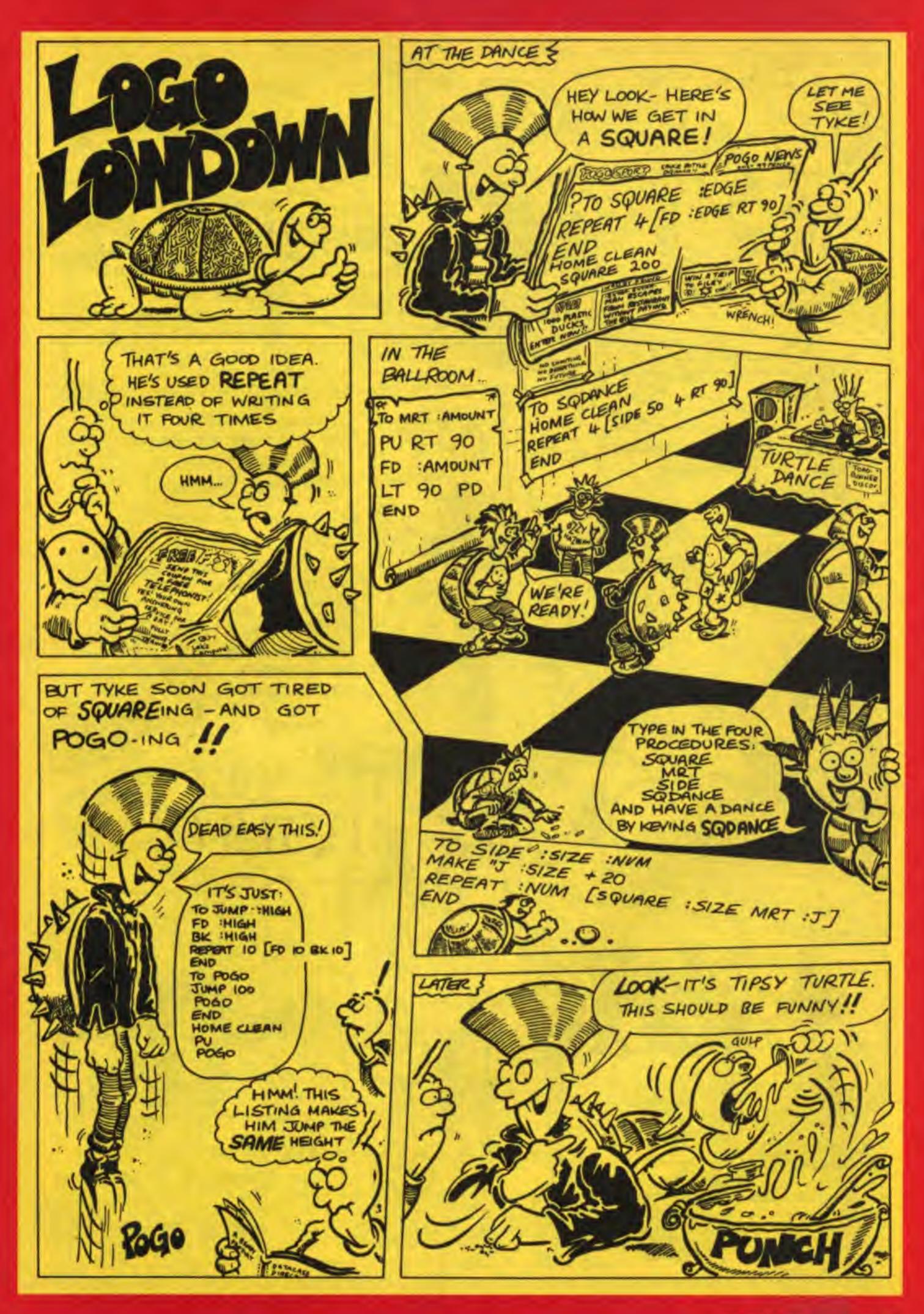
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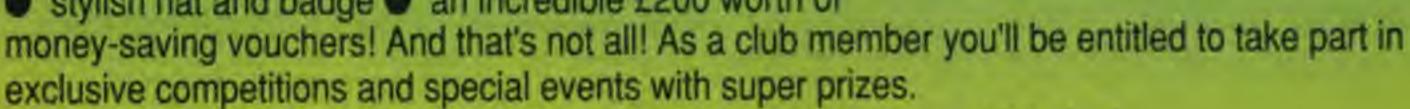
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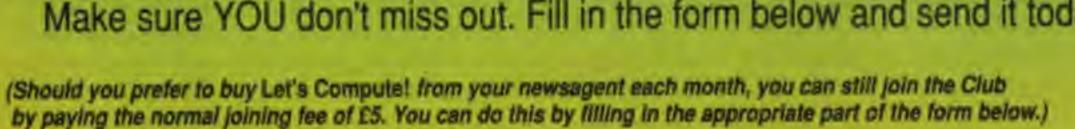
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What we call a program is nothing more than a list of instructions to your computer.

These instructions must be in a language that your computer can understand. Nearly all the listings in Let's Compute! are in the computer language Basic. This is understood by most home computers.

As a rule, if each line of a program starts with a number it's in Basic. And you must have Basic running in your computer before you start typing in a Basic program.

The BBC Micro, Electron, Spectrum, Amstrad CPC and Commodore 64/128 have Basic running from the moment they're switched on.

If you don't get the message BASIC when you switch on a BBC or Electron, type:

\* BASIC

Then press the Return key and you should be in Basic. On the Archimedes and BBC A3000 you usually see the Desktop when you switch on. If you press the F12 key a new line starting with a star will appear at the bottom.

Like on the BBC and Electron, type \*BASIC and you're ready to go.

WARNING: The Amiga, Atari ST and PC do not have Basic built in. You have to load it from disc.

You can get several different types of Basic for these computers. The programs in Let's Compute! Keying in a program listing is easy.

Or is it? Be warned! There are lots of pitfalls. One simple mistake could stop the whole program from working. But you can make sure YOUR typing is error free by following this simple advice.

are designed to run if you use Stos on the Atari ST or Amos on the Amiga.

Many people already have Stos and Amos. They come from Database Software (0625 859333). If you've got an Amiga, you'll also find that the BBC versions of the programs will work if you use Commodore's BBC emulator.

If you use a PC you will also have to load Basic from disc. Again there are several choices. The PC listings we give are for GW-Basic.

Most of the programs will also run on one of the versions of BBC Basic that you can get for the PC. If you use BBC Basic, choose the BBC listings, not the PC ones.

## SIMPLE STEPS TO SUCCESS

- Before you start entering a new program type NEW to empty the computer's memory
- A Basic program line begins with a line number. Don't press Return until you've typed the whole line. (That doesn't mean the line as you see it in print.) Pressing Return is the LAST thing you do before you get to the next line number.
- When you press Return after typing in a line nothing appears to happen. What you've done is store the line in the micro's memory. It will not be activated until you are ready to tell the program to RUN.
- Use the exact figures and letters that you see in the listing. Don't change ANYTHING.
- Capital letters MEAN capital letters (and lower case letters mean lower case letters).
- Take care with keys that can be mistaken for others. Examples are Ø (zero) instead of 0 or 1 instead of I.

- If you make a mistake while you're typing a line you can correct it so long as you haven't pressed Return. Use Delete to move back down the line and rub out the error. Then retype the part you erased.
- If you notice a mistake AFTER you've pressed Return just retype the whole line – including the line number. It will replace the one you got wrong.
- If you want to clear the screen type CLS and press return. This only wipes the display. Your program remains in the micro's memory. On the C64 use the CLR key instead.
- SAVE your program at frequent intervals while you type it in – don't wait until you've linished.
- To see the program stored in memory, type
   LIST.
- To make the program in memory work type RUN.

## Take care typing!

If you type in a program from Let's Compute! just as it is printed it will always work. But if you don't copy it exactly one of two things will happen:

- because your computer doesn't understand something you typed in.
- Something unusual may happen, but not what you expect.

In the case of the first of these you'll get an error message. It usually gives a line number as well

Check that line first. But your computer isn't always right! Some errors will report the wrong line number So check other lines too.

An example of the second type of mistake would be if you type 3+1 instead of 3-1. Your program would work but give you the wrong answers.

The motto is simple. It your program doesn't do what you expect - CHECK EVERY LINE!





## A key difference

Some computers have a key marked RETURN.
Others have one labelled ENTER. Some have both.
In Let's Computer when we say Return, you can use either Return or Enter.

RETURN

## SAVING AND LOADING

Make sure you SAVE your program at frequent intervals. Then if you have a power cut or the cat pulls out the plug you won't lose all your work.

First: decide on a short name for your program - say GAME - and then enter:

SAVE "GAME"

Notice that the program's name has quotes before and after it.

What happens next depends on whether you're using lape or disc. But the messages that appear on your

screen are clear and you should have no problems if you follow them.

To put the program back into your micro's memory at the start of a new session, all you have to do is make sure the tape or disc is ready and then enter:

LOAD "GAME"

When it's loaded you can LIST it, RUN it or, if you haven't completed typing it all in, continue adding more lines

## POINTS TO WATCH

The points listed in the main part of this article apply to ALL computers. Here are some more to watch out for on different machines:

## Spectrum

On 48k Spectrums you give instructions like PRINT and FOR by pressing one key. If you type all the letters of the word, instead of the single key that's on your keyboard, it will not work even if it looks right.

## Amstrad CPC

Spaces are very important on the CPC. Make sure you leave one between the Basic word and the rest of the line.

Joysticks - especially auto-fire ones - can upset how your keyboard works. If the wrong characters appear, unplug your joystick.

## PC (GW-Basic), Atari ST (Stos) and Amiga (Amos)

Take care that the line on the screen where you're typing is blank when you start. If there are any characters on it you could be in trouble. When you press Return after typing your new line you might see the message syntax error on your screen.

## Commodore 64/128

As with the PC, don't type on a line that already has something on it.

After typing a quote mark (") you may get strange characters. If you do, press Return and start again.

Take care when you type + or -. Remember you don't have to press Shift to get these.

If you do use Shift to get + you get something that looks right. But you'll get an error message when you run the program.

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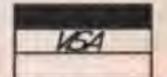
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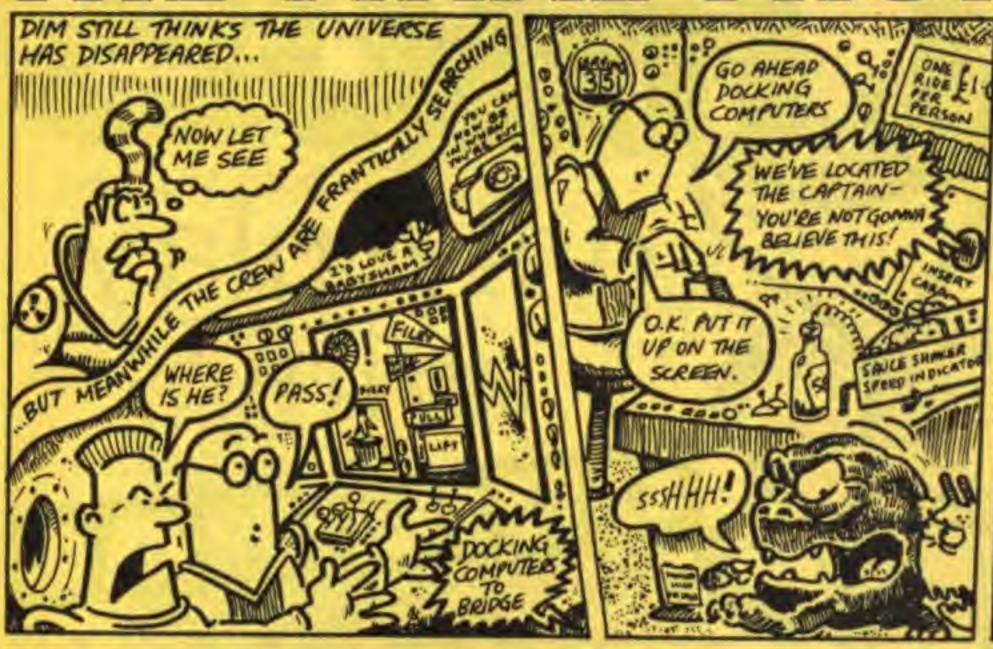
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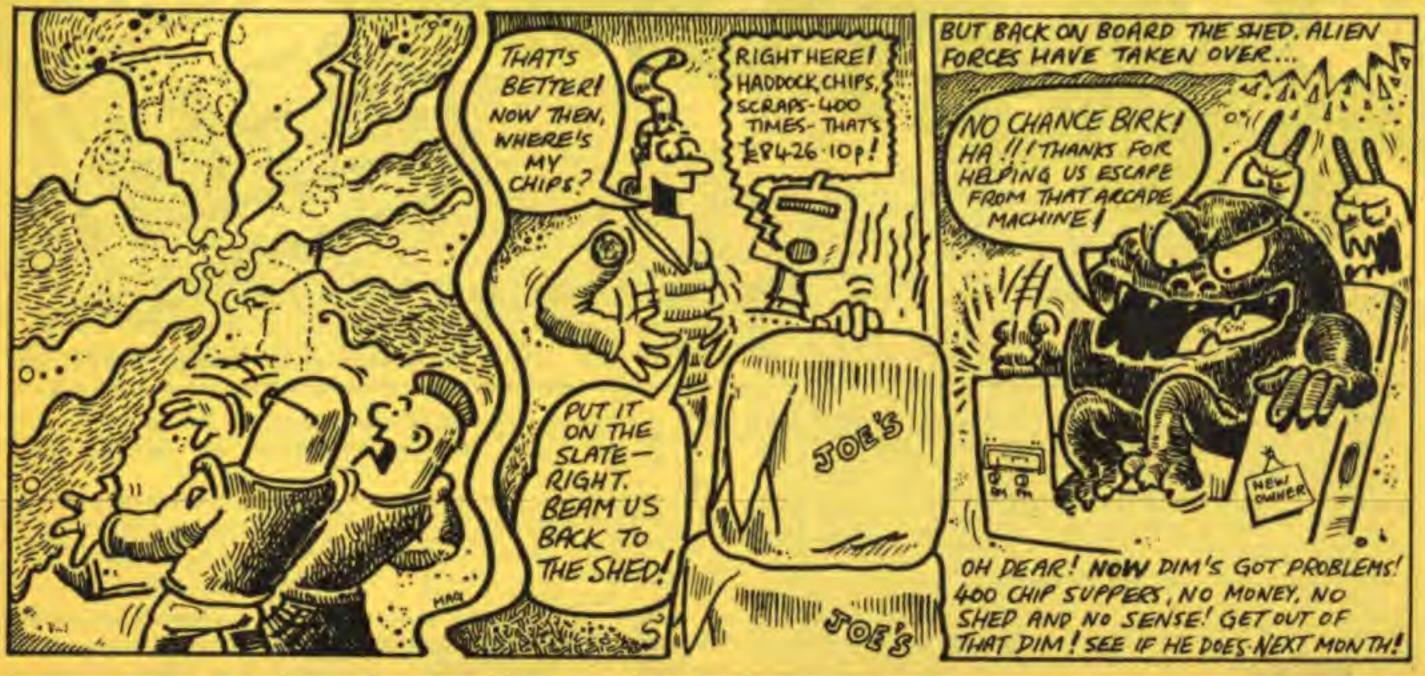
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